ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES

ANNUAL MANAGEMENT REPORT

1977

KUSKOKWIM DISTRICT

STAFF

BETHEL FIELD OFFICE -- P. O. BOX 90
Michael Jonrowe (Kuskokwim Area Biologist)
Rae Baxter (Kuskokwim Research Biologist)

ANCHORAGE REGIONAL OFFICE -- 333 Raspberry Road
Gary Schaefer (Kuskokwim Research Biologist)

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PREFACE

This report presents all available information concerning the management of commercial and subsistence fisheries in the Kuskokwim district. Although data from many special research projects are included in this report, complete documentation of these projects and results will be presented in separate reports. All catch data tables are based upon field data.

Data presented in this report supercedes information found in previous management reports. An attempt has been made to correct errors in previous reports and previously unrecorded data have been incorporated into this report which are so indicated by appropriate footnotes.

This report is organized into the following major sections:

1. District Introduction. This is a general and brief description of the area, inhabitants, fishery resources, fisheries and management practices.

2. District Summary. This section summarizes current year data for the area and makes comparisons with previous years.

3. Subdistrict Reports. There are several unique and separate fisheries in the district and separate comprehensive reports are presented for each.

In order to facilitate use of this report, the tabular data has been separated into current year tables and appendix tables where annual comparisons are made. The text for each major section is followed by current year tables and then appendix tables.

The following is an explanation of how effort and catch per unit effort data, presented throughout this report, have been derived. Total boat (or fisherman) hours are computed by arbitrarily assuming that if a fishing boat delivers in any 24 hour fishing period, it fished the entire period. If the period was more than 24 hours long, then the vessel is assumed to have fished the complete period for as many hours as was open to commercial fishing.

Catch per fisherman (or boat) hour is obtained by dividing the total fisherman hours into the catch for the corresponding period of time.

Total fishermen (or boats) is the total number of fishermen making deliveries, irrespectively of how many deliveries made or days fished during a particular "season". There are a number of fishermen who deliver only once or twice during the entire season.

"Total days fished" is the total number of hours open for commercial fishing during the season divided by 24.

Commercial catch information presented for the current year is derived from field data and not from finalized computer tabulations. Commercial catch data through 1975 are derived from final computer tabulations.

KUSKOKWIM DISTRICT

INTRODUCTION

District and Subdistrict Boundaries

The Kuskokwim district includes all waters of the Kuskokwim River drainage and all waters of Alaska between Cape Newenham and the Naskonat Peninsula. The present commercial salmon fishing area is divided into four subdistricts: subdistrict 1 (lower Kuskokwim River from Eek Island to Mishevik Slough below Tuluksak); subdistrict 2 (middle Kuskokwim River from Mishevik Slough to the Kolmakof River near Aniak); subdistrict 4 (approximately five miles of shoreline adjacent to the village of Quinhagak); and subdistrict 5 (Goodnews Bay). Subdistrict 3 (upper Kuskokwim River above the Kolmakof River) has been closed to commercial fishing since 1966 Figure 1. Table 1 shows the relative distances, in river miles, from three sites on the Kuskokwim River to various locations in the district.

Fishery Resources

All five species of Pacific salmon are indigenous to the district: i.e. chinook or "king" salmon (Oncorhynchus tshawytscha), sockeye or "red" salmon (O. nerka), coho or "silver" salmon (O. nerka), coho or "silver" salmon (O. kisutch), pink salmon or "humpback" (O. gorbuscha) and chum or "dog" salmon (O. keta). The largest population of kings, chums and cohos are found in the Kuskokwim River drainage, while reds and pinks are more numerous in the Kanektok and Goodnews Rivers.

Other important species common to the district include: inconnu or "sheefish" (Stenodus leucichthys) several species of whitefish and cisco (Coregonus sp.), Alaska blackfish (Dallia pectoralis), northern pike (Esox lucius) and burbot or "lush" (Lota lota). Additional species are listed in Table 2.

Commercial Fishery

Although the Kuskokwim district commercial fishery is the oldest in the AYK region with catches reported as early as 1913, commercial fishing did not mature for a half-century. For many years, small commercial mild-cure operations were conducted in or near Kuskokwim Bay while the Kuskokwim River fishery remained virtually undeveloped. During the 1930's when dog teams were intensely utilized for freight hauling, a "quasi-commercial" fishery operated in the McGrath area for the sale of dried, subsistence caught salmon for dog food. However, this fishery declined with the dog teams and the Kuskokwim district experienced little additional commercial effort until Alaska became a state more than twenty years later.

Commercial salmon fishing activity has grown significantly since statehood as district fishermen have been making the difficult transition from a subsistence culture to a cash economy. This has affected fishing effort, resulting in a tremendous expansion in fishermen numbers and in increased, sustained effort. Fishing vessels have remained virtually unchanged over the years, but increased utilization of highly mobile nylon drift nets has greatly improved the efficiency of the fleet. Of course, the overall expansion of the commercial fishery could not have

been accomplished without improvements in processing and tendering facilities that have occurred throughout the district (Appendix Table 1).

King, red, coho, pink and chum salmon are of primary commercial significance in the Kuskokwim district. Although these fish are commercially utilized locally to some extent, the vast majority are transported from the district as a fresh or frozen product. Sheefish and whitefish are harvested incidentally to the salmon catch, however, a limited fall and winter "whitefish" is conducted to satisfy local market requirements.

Subsistence Fishery

District residents have long depended upon the fishery resources as a source of food. Until relatively recently, traditional fishing methods and materials limited the size and scope of the fishery. Spears, dip nets, fish traps, and willow or caribou strip gill nets were slowly supplanted by more efficient linen gill nets enabling the fishery to expand tremendously. Whitefish, cisco, black fish, pike, burbot, and sheefish have been historically utilized along with salmon, particularly chum salmon. Recent improvements in fishing gear, notably the introduction of nylon gill net webbing, have increased the availability and importance of king salmon since statehood. Estimated peak subsistence salmon harvest levels were reached during the 1930's coincidentally with the quasi-commercial McGrath fishery, but harvest trends indicated a continuing decline into the 1940's. Little additional catch data is available for the twenty year span prior to statehood (Appendix Table 1).

Today the dependence on fish for personal use remains as important as money realized from the commercial fishery. However, several factors, as yet not totally defined, are affecting the complexion of the subsistence fishery. These factors include:

(1) Increasing commercialization of subsistence products.

(2) Cultural changes of local residents.

(3) Various State and Federal social-aid programs.

Any management of the Kuskokwim district fishery resources must take into account the growing - and changing - requirements of the subsistence fishery.

Subsistence Salmon Roe Fishery

The Governor approved legislation on May 29, 1975 allowing the sale of subsistence caught salmon roe within the AYK region. In order to administer the legislation, the Commissioner of Fish and Game issued an emergency regulation in June, 1975 which controlled the purchase and sale of subsistence roe in portions of the region. The key elements of the emergency regulation were:

(1) Permits are required of all persons or companies purchasing or processing subsistence-caught roe.

(2) Revocation of permits upon violation of permit terms, regulations or laws.

(3) Strict reporting requirements in regard to amount of subsistence-caught roe in order that estimates of subsistence harvests can be made.

(4) Prohibition of subsistence-caught roe sales when subsistence harvests are likely to exceed traditional personal use needs.

(5) Prohibition of subsistence-caught roe sales in districts and subdistricts where salmon runs are especially vulnerable to overharvest or where subsistence catches in the past have been negligible.

Numbers of salmon were "back-calculated" from reported subsistence roe poundages by utilizing in-season sampling of the various runs. Therefore, estimates of the subsistence harvest were possible and were available for inseason management purposes.

The 1975 "subsistence roe bill" expired December 31, 1976. However, a new subsistence roe sales bill was passed for the 1977 season and the regulation of subsistence roe sales continued as in the past. Further information is available in the 1977 Report to the Board of Fisheries entitled, Sale of roe from subsistence caught salmon in the Arctic-Yukon-Kuskokwim region, 1974-1977.

Management

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of the commercial and subsistence fisheries within the Kuskokwim district. The permanent staff assigned to this district includes one management biologist and twe research biologists. In addition, 10-15 temporary summer employees are hired each season to assist the permanent staff in conducting various management and research studies.

The main objective of the Department's program is to manage the commercial salmon fisheries on a sustained yield basis in addition to obtaining needed information to determine the potential for commercial fisheries on under utilized species such as herring, char and whitefish. Present commercial salmon fishing regulations are still relatively restrictive in order to insure that sufficient salmon are provided for subsistence fishery and spawning ground requirements.

The basic regulation that governs the commercial salmon harvest in all districts is the scheduled weekly fishing period. Commercial fishing is normally allowed from 12 to 48 hours a week during the open season, dependent upon the subdistrict and species involved. Fishing effort usually occurs during the entire run and not just during any particular segment of the run. Duration of the actual fishing period is dependent upon fishing conditions, the strength of the runs or spawning escapements as determined by special studies conducted by the Department.

Due to the vast size of the area and the turbid nature of many streams, accurate estimates of the size of salmon runs and the spawning escapements are difficult to obtain. Fishery management is also hampered

by the relative lack of comparative catch and return information since all the fisheries were either initiated or expanded through regulation changes since 1961 and 1962. The management problem is further compounded by having to provide sufficient escapement after commercial fishing for the important subsistence fishery as well as for spawning purposes.

For these reasons the present commercial fishery is still considered to be somewhat experimental in nature. It has been a policy of the Alaska Department of Fish and Game to maintain recent levels of commercial utilization for a few years in order to establish definite trends in subsistence utilization and to obtain more information on the relationship between the salmon catch and return.

If there is no apparent change in run size, it is the Department's policy to increase commercial utilization once trends in declining subsistence utilization can be established. It should be pointed out that increases in commercial fishing effort and efficiency have occurred and may balance any immediate decline in subsistence utilization with the result that present regulations will be maintained or even made more restrictive.

A brief list of emergency orders and regulations promulgated during 1977 is presented in Table 3.

Regulatory changes enacted by the Alaska Board of Fisheries at their December meeting in Anchorage are shown in Table 4.

Table 5 lists special studies undertaken during 1977 and include a summary of objectives and results.

A unique problem in the area is the so-called language barrier. Many of the older native people cannot read or speak English. Therefore, the staff must use translators when conducting the many public meetings that are annually conducted throughout the area. In addition, many special regulation notices are distributed in both the English and Eskimo languages. While it may normally take only half an hour or so to conduct a public meeting or hearing in English, it usually takes two to three times that long when Eskimo translators are used. To assist in the information and education program, a weekly fishery program is broadcasted over radio KYUK in Bethel. Additionally, the Department contributes to the bi-weekly newspaper, Tundra Drums.

DISTRICT SUMMARY OF THE 1977 COMMERCIAL FISHERIES

Licensing

Recent license registration levels have increased tremendously, although most 1977 totals were slightly below record 1974 levels. Commercial license registration increased to 1,265 and was 25% above the previous five-year average of 949 licenses. Vessel licenses totaled 822 which was a 9.2% decrease from 1974, but was 11.7% above the 1972-1976 average of 726 licenses. Drift gill net registration dropped to 737 (13.6% decrease), but represented an increase of 6% above the recent average of 693. Set gill net registration remained low and totaled only

32 licenses, or 23.8% below the recent five year average of 42 licenses. Overall, the 1977 registration of 2,856 licenses decreased 3.8% below record 1974 levels, but remained 15.6% above previous five year average levels (Appendix Table 2).

The Kuskokwim district remains a resident fishery, as 99% of all 1977 gear licenses were residents of the district (Table 7). These fishermen move freely between subdistricts so registration data does not correspond with the total number of fishermen who fished each subdistrict. The total number of fishermen making deliveries at least once in each subdistrict was: 335-10,653, 335-20,105; 335-40,258, and 335-50,34.

Gear license holders are issued permanent registration numbers which do not change during the life of the individual fishermen. Whenever actual numbers of fishermen are given this report, they refer to data obtained from permanent registration numbers.

Commercial Catches

The 1977 commercial salmon catch of 639,998 was the largest ever recorded and was 22% above the previous record 1974 harvest. This catch also exceeded the previous five-year average of 379,917 fish (Appendix Table 3). Species composition was: 58,256 kings, 18,621 reds, 263,728 cohos, 434 pinks and 298,959 chum salmon (Table 8). Intense fishing effort and a better than average run put the king salmon catch at the highest level since 1970 (Appendix Tables 3 & 4). The chum salmon catch was the largest on record, while the red salmon harvest was the second largest. The coho salmon harvest was also the largest ever recorded and the pink salmon catch was typically low for this "even year cycle" species. Commercial catches of all species were strongly influenced by intense, consistently high fishing effort increased fleet efficiency, and record prices received for the catch.

Average 1977 salmon weights are presented in Table 9.

Buyers and Processors

Table 6 includes all buyers and processors that operated during 1977 in the district. Appendix Table 5 compares the 1977 pack to previous years and Appendix Table 6 presents the mean salmon weights and the prices paid to fishermen for the last fourteen years.

Economic Value

Commercial fishermen received approximately $3,892,000 for their catch in 1977 (Appendix Table 7) while a minimum of $200,000 in wages was estimated to have been earned by processing plant employees and tenderboat operators. Prices paid for subsistence salmon roe were greater than 1976 levels, and about $635,000 went to subsistence fishermen from the sale of this product.

ENFORCEMENT

The most common violation that occurred during this past season was commercial fishing without a commercial fisheries entry permit. This was the result of "newness" of the entry permit system, the exclusion of some fishermen that in past years would have received interim limited

entry permits, a greater enforcement effort on the part of the Dept. of Public Safety, and various other factors. In most cases concerning limited entry permits, the citation was voided if, in fact, the individual was eligible, but had not yet received his or her permit.

Other enforcement problems that occurred this summer included commercial fishing in closed waters, subsistence fishing in closed waters, fishing a gill net over 50 fathoms in length, and the selling of subsistence caught salmon.

As in the past, the Department of Fish and Game vigorously pursued a program of informing the public of impending closures by utilizing the local radio station, C. B. radio, telephone and by personal contact. Additionally, in 1977 a two-man crew spent six weeks in the Akiak-Fowler Island area collecting subsistence information and explaining pertinent regulations to fishermen. Reports persist of illegal fishing in the Goodnews River of subdistrict 5. Continued fishing in closed areas could endanger various salmon runs and result in increased restrictions upon the commercial and subsistence fisheries.

Overall enforcement effort this past summer as conducted by the Dept. of Public Safety was much improved over previous years.

KUSKOKWIM RIVER (SUBDISTRICTS 1 & 2)

Commercial Fishery

The greatest amount of fishing effort and the largest commercial salmon catches occur within the 108-mile long Kuskokwim River subdistrict 1, (stat. area 335-10). There are 12 villages and at least 15 temporary fish camps located within the boundaries of this subdistrict. A majority of the district residents utilize the fishery resources for both commercial and subsistence purposes.

Set gill nets and drift gill nets are the legal types of commercial gear that can be operated in the Kuskokwim River. The gill nets cannot exceed 50 fathoms in length. After June 25, a six inch maximum mesh size restriction is in effect in the commercial chum salmon fishery located below the village of Napakiak.

Lower Kuskokwim River commercial fishermen operate highly mobile drift gill nets. This type of fishing is conducted by laying out 35 to 50 fathoms of gill net from a skiff and then drifting with the river current. Drift net fishing requires a section of river that is relatively free of snags. Set gill nets are not utilized to a great extent by commercial fishermen and are used mainly for subsistence fishing. Commercial set gill nets are fished in small eddies along the bank of the Kuskokwim River and larger eddies out in the main river. Set gillnetting is done with much shorter nets, usually 5 to 15 fathoms in length, which tend to be more poorly constructed than do the drift gill nets.

Although there are no mesh size restrictions regarding nets operated in the lower subdistrict through June 25, most nets used during this time consist of 8-1/2 inch stretched mesh webbing. After June 25, a six inch stretched mesh size limitation is in effect and most nets consist of 5-1/4 - 5-1/2 inch stretched mesh. Depths of king salmon nets range mainly from 28-40 meshes deep, although additional deeper nets (45-60

mesh) are entering the fishery. Nets used to capture the smaller species range from 30-60 meshes deep.

Kuskokwim River skiffs are long and narrow with a high bow. Generally, boats vary from 16 to 32 feet (23-foot average) in length and 2-1/2 - 3 feet in deck width, although wider, more stable vessels are now entering the fishery. Boats are generally poor for fishing as they are unstable, too narrow for a stern roller, and the sides and stern are generally too low to carry too much of a load.

Several important regulations affecting commercial fishing efforts on the Kuskokwim River are:

1) Until June 26, commercial fishing periods are regulated by emergency order. This allows scheduling of the king salmon harvest throughout a greater portion of the run. This is necessary because of the intensive nature of the king salmon fishery. Fpr the past two years the "king salmon season" has consisted of two 6 hour commercial fishing perids. In the future the fishing period length will probably remain the same, but the time between commercial fishing periods will most likely be increased.

2) Commercial fishing periods are limited to two 6-hour periods each week during the chum salmon season. This helps offset the increased effort and efficiency of the fleet and distributes the allowable harvests over a greater portion of the salmon run.

3) Commercial fishing is allowed only below Napakiak (the lower 72 miles of river) during the "chum salmon season" (June 26 - July 31). Only gill nets of six-inch stretch mesh or less can be operated during this time. Restricting fishing to the lower portion of the subdistrict enhances fish quality, helps prevent excessive harvest and wastage, and allows subsistence demands to be met. The gill net mesh restriction minimizes the capture of king salmon, particularly the larger, more fecund females.

4) Subsistence fishing is prohibited for 24 hours before and for 6 hours after each commercial fishing period in subdistrict 1 prior to June 25. During the "chum salmon season" (June 25 - July 31), only the lower subdistrict below Napakiak is affected. This regulation reduces the sale of illegal salmon and provides for a more even escapement distribution. It also reduces fish wastage, as subsistence fishermen are required to check their gear at regular intervals throughout the commercial fishing season.

5) After July 31, commercial fishing periods are regulated by emergency order. This allows fishing effort to be regulated according to the magnitude of the variable coho salmon run. It also allows fishing time to be altered to insure maximum fishermen safety during poor weather conditions in August.

A limited commercial fishery is also conducted in the 118 mile long subdistrict 2. Commercial fishermen in this subdistrict are limited to catch quotas of 2,000 king and a combined total of 2,000 red and chum salmon and 2,000 coho salmon. The majority of commercial catches are taken in the Tuluksak-Kalskag areas, while the remainder of the subdistrict is primarily devoted to subsistence fishing. Set gill nets and drift gill nets are found in this subdistrict, however, set gill netting predominates.

King Salmon: Only since statehood have king salmon stocks been used significantly by Kuskokwim River fishermen. King salmon commercial and subsistence harvests averaged only 56,237 fish for the 10-year period 1960-1969, but increased to 70,889 during 1972-1976. Effort remained high during the 1977 season and total utilization was 91,169 fish (Appendix Table 8); this is the second highest number ever recorded.

Annual commercial catches ranged between 30,000 to 40,000 king salmon from 1968-1972. A guideline harvest was instituted within this range in an attempt to stabilize the fishery until additional data regarding run size and escapement was obtained. The small runs experienced during the past few seasons indicated the 30,000-40,000 harvest range was too optimistic. Commercial harvests since 1974 have ranged from about 19,000-35,000 and the current guideline harvest for the entire river is 22,000 fish during the "king salmon season". A few thousand additional fish are taken during later seasons when fishing is directed on other species.

The "king salmon season" in the lower subdistrict is not opened until subsistence catches indicate the early portion of the king salmon run has reached the Kalskag-Aniak area and relatively good sustained catches are being made at the Department's test fishing site at Kewgooyuk (56 river miles below Bethel). The late opening of the king salmon season helps to prevent over-harvest of the early run and gives subsistence fishermen an opportunity to begin fishing without interruption from the commercial fishery.

In 1977 the ice on the Kuskokwim River first moved on May 23, at Bethel, and the river was completely free of ice by June 1. The first reported king salmon was caught on May 31 at Kalskag, nearly 200 miles upstream from the mouth of the river.

After two 6 hour fishing periods on June 15 and 20, the commercial king salmon season in subdistrict 1 was closed with a resultant catch of 28,685 kings (Tables 10-12). The commercial king salmon season in subdistrict 1 was not extended for an additional period due to an excessive combined commercial and subsistence catch. In retrospect, this was the proper strategy, as the combined king salmon catch was the second largest since statehood.

Commercial fishing effort during the king salmon season in subdistrict 1 totaled 563 fishermen, a 7% decrease from record 1974 levels. Fishermen hours decreased to 5706, the lowest on record, and the number of equivalent days fished was .5 (Appendix Table 9). Catch per vessel hour figures of 5.0 were the highest ever documented, which is to be expected due to the short season and better than average sized run.

An additional 2,974 king salmon were taken incidentally during the later chum and coho salmon seasons bringing the total commercial harvest in subdistrict 1 to approximately 31,600 fish. This was the greatest commercial catch since 1973 and similar to the recent 10 year average, but, 15% above the previous 5 year average. The subdistrict 2 commercial fishery was opened for 30 hours during June 20-22 when 3,975 kings were taken. Eighty-three fishermen made commercial landings during the 1977 king salmon season (Table 13). This is the largest number of fishermen ever participating in the king salmon fishery in this subdistrict.

An additional 196 king salmon were harvested incidentally during the later chum and coho salmon fishing periods. The total commercial commercial catch therefore totaled 4171, which is the largest subdistrict 2 king salmon catch on record.

The total king salmon catch for the Kuskokwim River numbered 35,830. This is 20% above the previous 5 year combined commercial and subsistence catch.(Appendix Table 8).

Data from the Department's test fishing site indicated that the king salmon run peaked about June 12 and was above average in magnitude.

Chum Salmon: Prior to 1971, chum salmon catches represented only fish taken incidentally to the king and coho salmon fisheries. A commercial chum fishery was initiated in 1971 due to several factors:

1) Early subsistence catch estimations during 1924-1943 indicate an average annual catch of 448,000 chum salmon, compared to an average 221,000 chum salmon taken yearly during 1960-1970. This represents a reduction of 227,000 fish per year. This subsistence harvest reduction is believed to have been largely influenced by lessening dependence on subsistence fishing.

2) There is a minimum of 16 known chum salmon spawning tributaries in the Kuskokwim River system. Most of these streams cannot be surveyed annually due to fund limitations and adverse stream or weather conditions. Usually, not more than three tributary streams can be adequately surveyed in any given season, but as many as 185,000 spawning chums have been counted. This indicated a significant chum salmon population.

3) Commercial catches were believed to be able to provide additional information regarding the size, timing and magnitude of the chum salmon run in addition to age, sex and size composition.

Total utilization figures have increased steadily since the inception of the commercial chum salmon fishery with a total of 458,915 fish being caught in 1977. This figure is slightly above the previous 1974 record harvest; it is also 24 percent above the previous five-year average (Appendix Table 10).

The "chum salmon season" in subdistrict 1 is opened after June 25 below markers placed at the village of Napakiak. Commercial fishermen must use nets of less than 6-inch stretched mesh. The delayed opening dates combined with the mesh restriction minimizes incidental harvests of king salmon, while restricting commercial fishing to the lower portion of subdistrict 1 allows subsistence fishermen to meet their requirements.

The 1977 commercial chum salmon season in subdistrict 1 was opened on June 27 and five 6-hour fishing periods were fished until July 14 during which time 218,413 chums were sold (Tables 10-12). This was a record harvest for this season and was 34 percent above the recent five year average. Commercial fishing effort totaled 522 fishermen, slightly below the record 1975 level. (Appendix Table 11). Catch per unit effort data for both commercial and test fishing catches were above average.

Subdistrict 2 was reopened for 12 hours on July 4-5. A total of 54 fishermen landed 15,160 chum salmon. This was the largest chum catch ever made commercially in this subdistrict. The catch also greatly exceeded the 2,000 chum and red salmon combined quota. The reason for this excess catch was due to a shift in fishermen effort from subdistrict 1 to subdistrict 2.

Coho Salmon:

The commercial coho salmon season in subdistrict 1 opened on August 2 with a 24 hour fishing period. Subsequent fishing periods through August 31, when the season was closed, were as follows; August 8-10, 48 hour commercial fishing period: August 15-16, 24 hour commercial fishing period: August 18, 22, 25 and 29 had 12 hour commercial fishing periods.

The change in fishing schedule was necessary due to the extreme magnitude of the 1977 coho salmon. For example, several thousand cohos spoiled after a record catch of over 91,000 salmon were caught on August 8-10. The total coho season catch this season was 237,658 fish. This was 39 percent larger than the previous 1974 record catch of 144,823 cohos. This year's catch was also more the 2-1/2 times the previous five year average. (Tables 10-12, Appendix Table 12).

The reasons for this unpredented catch were a good return, record prices paid to fishermen, and a record number of fishermen (572) participating.

In subdistrict 2 of the Kuskokwim River the coho season opened for 24 hours on August 15. A total of 3,705 salmon was harvested by 24 fishermen (Table 13).

Subsistence Fishery

Methods: The annual survey of the Kuskokwim River subsistence fishery was initiated in 1960. During the early years, the Department utilized "smokehouse counts" to determine total utilization of subsistence caught fish. In an effort to determine additional timing and magnitude data, the Department began using "subsistence catch calendars" which are distributed to fishermen prior to the fishing season. Subsistence fishermen enter their daily catches of salmon and non-salmon species on the calendar. During July and August a Department crew utilizes a cabin skiff to travel more than 360 river miles (Eek to Swift River) to collect catch data from the individual fishermen in addition to recording certain information from non-fishing families. After the river survey is completed, catch questionnaires are sent to those fishermen not individually contacted.

In the 1969 Annual Report, a review is presented regarding methods used to obtain subsistence harvest and related information. All subsistence information presented in tabular form in this report, except in Appendix Table 17 represents "expanded data". This includes those families known to have fished but for one reason or another were not personally contacted by the survey crew. Catch data for these families are assumed to be the same as the averages for the particular village and are included in most of the tables.

Reported coho salmon catches are very minimal as the coho salmon run occurs after the survey is completed. Most of the coho salmon catch data is obtained from the return of catch calendars. Prior to 1969, little effort was made to determine the coho salmon harvest. The coho salmon estimates are not included in the comparative catch tables.

Catch and Effort: The Kuskokwim River system's harvest included 55,339 king salmon, 198,355 chum salmon, and 12,203 coho salmon utilized by 629 fishing families during 1977 (Table 15).

The king salmon catch was the second largest since 1970 and was 30 percent above the 1960-73 average. The 1977 king salmon catch was also 15 percent above the 1974-77 "roe sale years" average of 46,926 (Appendix Table 13).

The chum salmon harvest was also larger than the 1960-73 average catch (2%) but smaller than the 1974-77 average catch (6%). Appendix Table 14 contains the comparative subsistence chum salmon catch information.

In order to evaluate the effect of snowmachines on the subsistence harvest, all fishing families interviewed since 1967 have been checked for the number of snowmachines they owned. The number of families owning snowmachines has more than doubled since 1969 (Appendix Table 15). Average numbers of snowmachines per fishing family during 1967-1975 are shown in Appendix Table 16.

The public relations aspect of the annual subsistence fishery survey is important to the success of the survey itself and the Department's management program. By any method tested, the results of the voluntary contribution of the people of this program are as accurate as the people are capable of giving. The major problem is that many of the fishermen are illiterate and speak only Eskimo and have to relay much of the catch information through their school age children.

There is still a moderate sale or trading of dried salmon on the Kuskokwim River, but is not documented. People from the coastal delta villages still bring their pokes of seal oil to trade for dried fish. The lower river dried fish are now primarily being used for human consumption.

The use of the fishwheel to capture salmon is slowly disappearing from the Kuskokwim River. Only 9 fishwheels were used along the survey route in 1977, compared to 30 in 1965 and 65 in 1960. The fishwheel is being replaced by the much more mobile gill net, which involves a lot less time and effort to operate. The use of gill nets is a relatively new technique for most Kuskokwim River residents. The efficiency of the two types of gear is difficult to evaluate, as large catches are often made with both. Table 15 represents an overview of all the subsistence data conducted in 1977.

Escapement

Kuskokwim River drainage escapement estimates from aerial surveys have proved difficult and costly to obtain. Varying stream and weather conditions, in addition to pilot and observer skills, often make the data difficult to interpret (Appendix Table 18). Although aerial surveys will be continued for some streams, emphasis will be placed on obtaining accurate escapement figures by use of counting towers or weirs on several "key" spawning tributaries.

All the Kuskokwim River aerial survey results for 1977 are presented in Table 18. Escapements of kings, chums and reds were generally above average as documented by aerial survey. It should be noted that survey efforts were hampered in 1977 by unusually high and turbid stream conditions. In several instances no surveys were possible for some of the major salmon spawning streams.

A counting tower has been operated yearly on the Kogrukluk River (Holitna River system) since 1969 (except 1971). In 1977, excessive turbidity also affected the tower counts. The only dates counted were from July 7-27. Counting at night was not possible until July 18.

The estimated salmon run past the tower was projected at: 1,988 kings, 2,140 reds, 10 pink and 5,047 chum salmon.

The Holitna River weir enumerated 1,385 kings, 1,112 reds, and 10,388 chums during the period from July 14-27, 1977. During the first year of operation in 1976 the weir crew counted 5,507 kings, 2,302 reds, and 8,046 chums during the period from June 29 to July 31, 1976.

The brief period of operation in 1977 was due to extreme high water levels which never receded to the highest recorded levels of water depth experienced during weir operation last year. Water depths at the deepest part of the weir ranged from a low of 5 feet to over 7 feet.

QUINHAGAK (SUBDISTRICT 4)

Commercial Fishery

The Quinhagak fishery is one of two located south of the Kuskokwim River mouth (Figure 1). This fishery has traditionally been very sporadic due to unstable processing facilities, however, the commercial fishery has stabilized during the past few seasons.

Fishing regulations for this subdistrict are very similar to those found on the Kuskokwim River, except that there are no distinct fishing seasons. Beginning with the 1971 season, the basic fishing period was reduced from two 24-hour periods to two 12-hour periods per week. Commercial fishing is allowed only in Kuskokwim Bay waters. This is necessary to ensure escapement of adequate numbers of salmon up the narrow Kanektok River. The vast majority of gear operated consists of drift gill nets that are fished at low tide in "gutters" located two to three miles offshore and next to shore at high tide. Most of the fishing takes place near the mouth of the Kanektok River.

The Kanektok River king salmon run is later than that of the Kuskokwim River and for this reason the Quinhagak fishery opening is delayed until

mid-June. The delayed opening pervents possible interception of Kuskokwim River fish and aids in preventing overharvest of the king salmon run.

Fishermen were required to use small mesh gear (6-inch stretched mesh or smaller) during the entire commercial fishing season. This was necessary primarily to prevent selective harvesting of the larger, more productive king salmon by the large mesh nets. However, the mesh limitation was also designed to increase harvests of the more abundant "other salmon" species (i.e. red, pink, chum, and coho).

The commercial salmon season was opened on June 16 with two 12-hour fishing periods a week. This schedule was interrupted in late June when the June 30 fishing period was deleted due to excessive fisherman effort and a record king salmon catch to date. The large numbers of fishermen fishing this subdistrict also prevented the three 12 hour commercial fishing period a week schedule (which is normally implemented in July in order to harvest the more numerous chum and red salmon) from going into effect until the week of August 14 when fishermen effort declined (Table 16). A total of 19,090 kings, 5,519 reds, 9,028 cohos, 202 pinks and 43,707 chums totaling 77,546 fish was taken. The king salmon catch was the largest recorded and was 2 percent larger than the previous 1970 record catch. Red salmon, coho salmon and pink salmon were respectively 31%, 14% and 99% below the previous 5 year averages. The chum salmon catch was the third largest record and was 40% above the previous 5 year average. Commercial fishing effort totaled a record 258 fishermen which is 24% above the previous 1974 record of 196 fishermen.

Subsistence Fishery

Accurate comparable subsistence data has been lacking for the Quinhagak subsistence fishery during recent years. However, observation by the staff indicates that dependence on subsistence fishing has not been high. Apparently the greatest amount of fishing effort occurs in the Kanektok River after the commercial fishing season when mostly coho salmon are taken.

Methods used to tabulate catches made by Quinhagak fishermen were similar to those used for the Kuskokwim River survey. A total of 60 Quinhagak fishing families returning catch calendars reported catching 2,012 kings and 4,368 "other salmon".

Appendix Table 17 shows comparative catch data for 1967-77.

Escapement

Escapement counts made during various aerial surveys of the Kanektok River system are shown in Table 18. Poor weather conditions frequently hampered aerial surveys in the Quinhagak subdistrict. The king salmon escapement appeared to be at above average in magnitude. Based on comparative catch data, escapement of all other species was probably average.

GOODNEWS BAY (SUBDISTRICT 5)

Commercial Fishery

Traditionally, the male residents from the villages of Goodnews Bay

and Platinum have gone to Bristol Bay each summer to fish or work in the canneries, leaving the women and children home to fish for subsistence purposes. Prior to 1968, there are no records indicating that commercial salmon harvests were ever made in Goodnews Bay. The Department held public meetings in the area during the early 1960's regarding the possibility of initiation of a commercial fishery, but the negative response from village residents plus the absence of salmon buyers precluded this development.

In late August of 1968, the commercial salmon fishing was opened by emergency order in Goodnews Bay. This commercial fishery was created as a result of a request from area residents and Department surveys, which indicated that a small harvestable supply of salmon was available. The fishery has been sporadic in nature due to inconsistant processing capabilities and inclement weather.

The commercial salmon season was opened June 16. The harvest was composed of 3,336 kings, 3,723 reds, 13,335 cohos, 29 pinks and 6,531 chums, totaling 26,954 fish. The king salmon catch was 25% below the 1976 harvest and 18 percent above the recent five-year average. Numbers of reds were 60% below the 1974 record level and were also 31% below the recent average. The coho salmon harvest was 38% below 1974 record but 19% above the five-year average, while the chum salmon harvest was 59% below the 1974 record and 24% below the recent average. Commercial fishing terminated on August 30, (Table 18).

A total of 34 fishermen made commercial landings in 1977, a decrease of 6 fishermen below 1976 levels.

Subsistence Fishery:

A total of 26 Goodnews Bay families were interviewed this year and those families reported taking 574 king and 1,038 of other species of subsistence salmon.

Escapement:

Escapements of all species in the Goodnews River appeared good.

OUTLOOK FOR 1978

KING SALMON

The majority of returning king salmon in 1978 will be five and six years of age. The Kogrukluk tower count in 1973 was the lowest on record and the 1972 tower count was below average. Aerial surveys conducted during 1972 and 1973 indicated average to below average escapement in spawning streams surveyed. Commercial and subsistence catch data indicate at least average runs occurred in 1972 and 1973.

Although brood years escapements (1972-1973) were below average, chum and coho salmon returns from those years (1972-1973) have proven to be above average. This possibly indicates that freshwater and/or marine survival may have been good for king salmon which should return in 1978.

Therefore, the anticipated run in 1978 is projected to be slightly below average to average.

CHUM SALMON

Chum salmon will return as three, four and five year old fish from the 1973, 1974 and 1975 brood years. The majority of the run will be composed of four year olds which are the progeny of 1974 spawners. Little comparative escapement information is available, but the Kogrukluk tower count of chum salmon during 1974 was 30% below average. However, the 1975 chum count of chum salmon at this site was 15% above average. Commercial catch per unit effort was slightly below average in 1974.

The projected chum salmon run in 1978 is expected to be no more than average.

COHO SALMON:

There is little information available to assess coho salmon abundance in 1978. The majority of cohos mature at four years of age with a few maturing at five years. Due to a lack of funding, very few coho salmon escapement surveys can be made. Commercial catches made during the 1973 and 1974 brood years were above average, but catch per unit effort data were only average.

PINK SALMON:

Pink salmon returns during even-years (1974, 1976, 1978, etc.) are normally good.

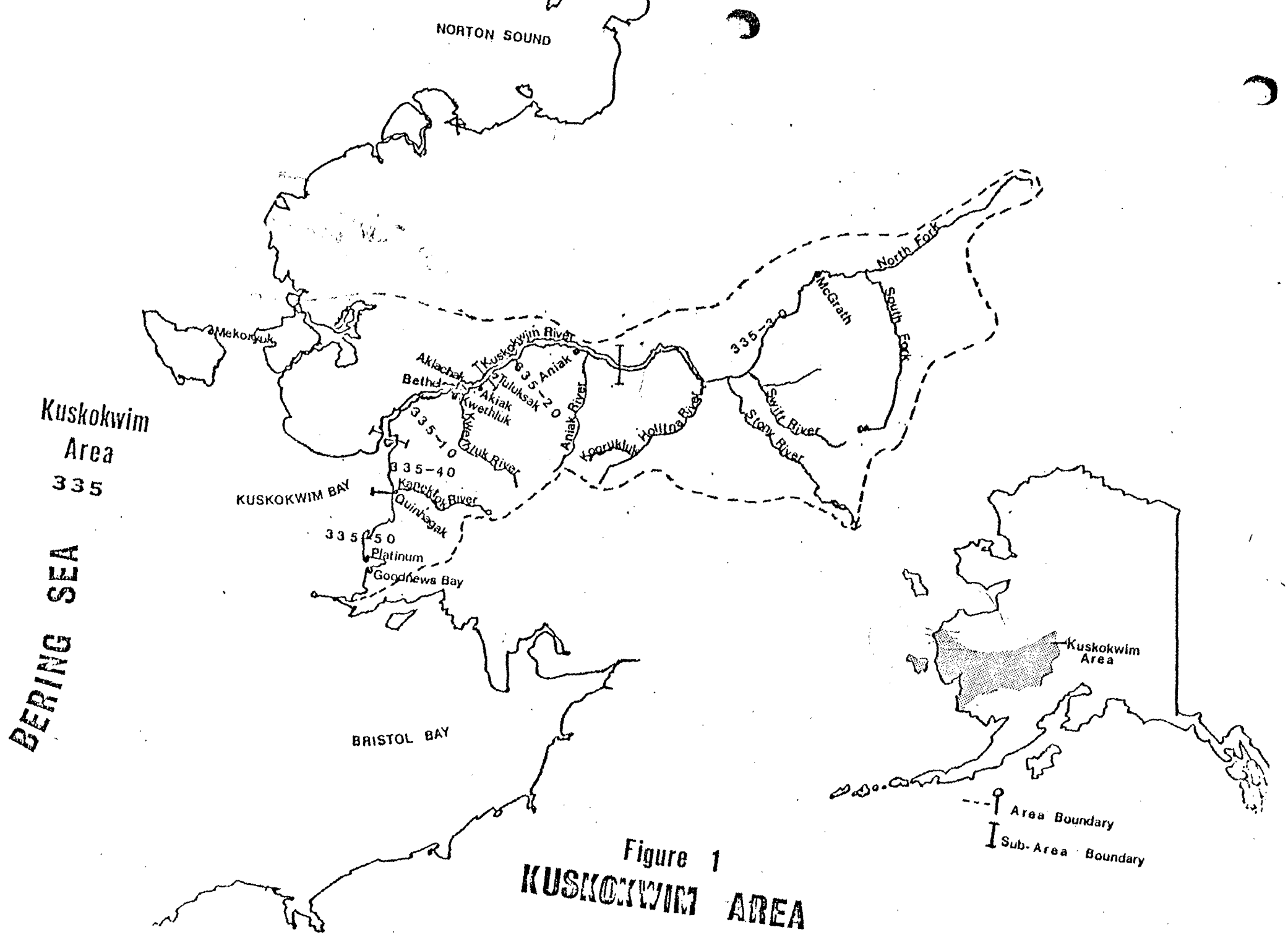

Figure 1
KUSKOKWIM AREA

Table 1. Kuskokwim district mileages.

Location	Mileages from Mouth	Kwegooyuk 1/	Bethel
Kuskokwim River			
Mouth	0	-30	-86
Eek Island 60°10' N. lat.	23	- 7	-63
Kwegooyuk 1/	30	0	-56
Tuntutuliak Village	43	13	-43
Kialik River Mouth	42	12	-44
Kialik Forks	58	28	-60
Fowler Island	55	25	-31
Johnson River	66	36	-20
Nunapitchuk	98	68	-52
Kasigluk	99	69	-53
Napakiak	72	42	-14
Oscarville	79	49	- 7
Napaskiak	79	49	- 7
Bethel	86	56	0
Kuskokwak River	102	72	16
Kwethluk	104	74	18
Akiachuk	112	82	26
Akiak	126	96	40
Mishevik Slough	131	101	45
Tuluksak	143	113	57
Lower Kalskag	189	159	103
Kalskag	192	162	106
Aniak	225	195	139
Chuathbaluk (Russian Mission)	236	206	150
Kolmakof River	249	219	163
Napaimiut	258	228	172
Oskawalik River	292	262	206
Crooked Creek	295	265	209
Georgetown	313	283	227
Red Devil	332	302	246
Sleetmute	339	309	253
Holitna River	341	311	255
Kasheglok	465	435	379
Kogrukluk River	467	437	381
Stony River Village	369	339	283
Stony River			
Lime Village			
Swift River	386	356	300
Devil's Elbow	407	377	321
Candle	491	461	405
McGrath	511	481	425
Big River	558	528	472
Medfra	582	552	496
Nicolai			
Telida			
Kuskokwim Bay			
Quinhagak	-19	-49	-105
Kagati Lake			
Goodnews Bay	-54	-84	-140
Platinum	-57	-87	-143
Goodnews Bay Village	-66	-96	-152
Chagvan Bay	-73	-103	-159

1/ Kwegooyuk is the location of Department's test fishing site.

Table 2. List of fishes found in the Kuskokwim area.

Species code	Genre species	Common name
161	Cottus aleuticus	Coastrange Sculpin
162	Cottus cognatus	Slimy Sculpin
410	Oncorhynchus tshawytscha	King Salmon
420	Oncorhynchus nerka	Red Salmon
430	Oncorhynchus kisutch	Coho Salmon
440	Oncorhynchus gorbuscha	Pink Salmon
450	Oncorhynchus keta	Chum Salmon
500	Esox lucius	Pike
513	Osmerus eperlanus	Boreal Smelt
514	Hypomesus olidus	Pond Smelt
520	Salvelinus alpinus	Arctic Char
530	Salvelinus malma	Dolly Varden
541	Salmo gairdneri	Rainbow Trout
550	Salvelinus namaycush	Lake Trout
570	Stenodus leucichthys	Shee
581	Coregonus nasus	Broad Whitefish
582	Coregonus pidschian	Humpback Whitefish
583	Coregonus sardinella	Least Cisco
584	Coregonus autumnalis	Arctic Cisco
585	Prosopium cylindraceum	Round Whitefish
590	Lota lota	Burbot, Lush
601	Lampetra japonica	Arctic lamprey
610	Thymallus arcticus	Arctic Grayling
630	Dallia pectoralis	Blackfish
640	Catostomus catostomus	Longnose Sucker
650	Hybopsis plumbea	Lake Chub
660	Gasterosteus aculeatus	3-spine Stickleback
661	Pungitius pungitius	9-spine Stickleback
670	Percopsis omiscomaycus	Trout-perch

ESTUARINE

113	Eleginus gracilis	Saftron Cod
121	Pleuronectes stellatus	Starry Flounder
122	Liopsetta glacialis	Arctic Flounder
166	Oligocottus maculosus	Sculpin
200	Hippoglossus stenolepsis	Pacific Halibut
230	Clupea pallasii	Pacific Herring
516	Mallotus villosus	Caplin

Table 3. Kuskokwim district emergency orders, 1977.

E.O.No.	Date	Action Taken	Justification
1	20 May	Prohibits commercial fishing for herring and smelt in waters of Etolin Strait south of a line between Cape Etolin and Naskonat Peninsula and north of line between Cape Corwin and Cape Avinov.	High dependence upon subsistence herring fishing by village residents in Nelson Island Area, and uncertainty of stock condition.
2	13 June	Closes sale of subsistence king salmon roe in subdistrict 1.	Quota attained.
3	14 June	Subdistrict 1 opened for commercial fishing 6 PM June 15, 1977 to 12 midnight.	Kings present in sufficient numbers.
4	15 June	Subdistricts 4 & 5 opened to commercial fishing 6 PM, June 16, 1977; periods to be 6 PM Monday to 6 AM Tuesday, and 6 PM Thursday to 6 AM Friday until further notice.	Kings present in sufficient numbers.
5	19 June	Subdistrict 1 opened to commercial fishing 6 PM to 12 Midnight.	Kings present in sufficient numbers.
6	20 June	Subdistrict 2 opened to commercial fishing.	Kings present in sufficient numbers.
7	21 June	Subdistrict 2 closed to commercial fishing.	Quota attained.
8	24 June	Subsistence king salmon roe sales closed in subdistrict 4.	Quota attained.
9	25 June	Subsistence king salmon roe sales closed in subdistrict 2.	Quota attained.
10	26 June	Subdistrict 1 opened to commercial fishing.	Chums present in sufficient numbers.
11	26 June	Subdistrict 4 period deletion.	Harvest over guideline.
12	4 July	Subdistrict 2 opened to commercial fishing.	Catches below quota.
13	7 July	All subsistence salmon roe sales in subdistrict 1 closed.	Quota attained.
14	7 July	All subsistence salmon roe sales in subdistrict 2 closed.	Quota attained.

Table 3. (continued)

E.O.No.	Date	Action Taken	Justification
15	11 July	Subdistrict 1 period deletion.	To meet escapement requirements.
16	18 July	Subdistrict 1 closed to commercial fishing.	Quota attained.
17	24 July	All subsistence salmon roe sales in subdistrict 4 closed.	Quota attained.
18	1 Aug.	Subdistrict 1 open to commercial fishing.	Cohos present in sufficient numbers.
19	1 Aug.	Subdistrict 4 fishing periods changed.	Fishermen safety.
20	7 Aug.	Establishes 48 hour fishing period in subdistrict 1.	To allow optimum coho salmon harvest.
21	14 Aug.	Increases number of fishing periods in subdistricts 4 and 5.	To allow optimum coho salmon harvest.
22	15 Aug.	Subdistrict 2 opened to commercial fishing.	To allow optimum coho salmon harvest.
23	15 Aug.	Subdistrict 1 fishing periods changed from one 48 hours period to two 24 hour periods per week.	To spread the commercial harvest evenly over a larger portion of of the coho salmon run.
24	18 Aug.	Subdistrict 1 fishing periods changed from 24 to 12 hour periods.	1) Record catch and effort. 2) To ensure adequate escapement of coho salmon.
25	1 Sep.	Extend salmon fishing season for one week in subdistrict 4.	Cohos present in sufficient numbers.

Table 4. Kuskokwim district regulatory changes adopted by the Board of Fisheries, December 1977.

1. The subdistrict 4 (Quinhagak area) commercial salmon fishing boundaries were defined as being between markers placed at the north mouth of the Arolik River and the mouth of Oyak Creek. No change in actual fishing area.

2. Regulation of weekly commercial fishing periods by emergency order in subdistrict 2. This is a change from the previous set fishing periods of from Monday until Friday.

3. Increase the legal maximum allowable dept for salmon gillnet from 30 to 35 meshes. This increase applies only to salmon nets of greater than 6-inch stretched mesh measure. This allows traditionally used gill nets to be used without modification.

4. Establish a 6-inch maximum mesh size in subdistrict 2 for commercial fishermen after June 25. This will reduce the incidental capture of king salmon when chum salmon are the target species.

5. Allows subsistence nets to be marked with a red bouy, keg, etc. when fishing in waters not opened to commercial salmon fishing.

Table 6. Kuskokwim District Processors and Associated Data, 1977

Commercial Operator	Product	Subdistrict
Alaska Seafoods c/o Frenchie Walsh Camp Bethel, Alaska 99559	Fresh Salmon King Red Chum Coho	1
Gerald Ball 3343 W. 80th Anchorage, Alaska	Fresh Salmon King Red Chum Coho Pink	5
James A. Charles Tuntutuliak, Alaska	Frozen Salmon King Chum Coho	1
Clark Fishing Enterprises Box 517 Aniak, Alaska	Fresh Salmon King Chum Coho Salmon Roe	2
Commencement Bay Fisheries 1112 54th Ave., East Tacoma, Washington 98424	Frozen Salmon King Red Chum Coho Pink Salmon Roe	4
J. B. Crow Box 567 Bethel, Alaska 99559	Fresh Salmon King Red Chum Coho Pink Salmon Roe	1,2,4,5
Elm Corporation Box 352 Bethel, Alaska 99559	Fresh Salmon King Chum Coho Pink Salmon Roe	1,2,4,5

Table 6. (continued)

Commerial Operator	Product	Subdistrict
Kachemak Seafood, Inc. Box 129 Togiak, Alaska	Fresh Salmon King Chum Coho Pink Red	5
Kemp-Palucci Seafoods, Inc. Box 252 Bethel, Alaska 99559	Frozen Salmon King Chum Coho Red Pink Salmon Roe	1,2,4
K & A Fisheries c/o Joe Parent Kalskag, Alaska 99607	Fresh Salmon King Coho	2
DBA Kusko Sales c/o J. & D. Matter Box 28 Aniak, Alaska	Fresh Salmon King Chum Coho	2
Patson Enterprises Box 445 Bethel, Alaska 99559	Fresh Salmon King Chum Coho Pink Red Salmon Roe	1,4
Togiak Fisheries 2366 Eastlake Ave., East Suite 335 Seattle, Washington 98102	Fresh Salmon King Red Chum Coho Pink	5
Vita Foods	Salmon Roe	2
Yugtak Fish Company Box 668 Bethel, Alaska 99559	Frozen Salmon King Red Chum Coho Pink Salmon Roe	1,2,4,5

Table 7. Kuskokwim distict licenses issued by villages and subdistricts, 1977.

Area	Village	Commercial	Vessel	Drift	Set	Tender	Total
335-10	Kwigillingok	14	9	9	1		33
	Kipnuk	20	10	10			40
	Kongiganak	36	20	20			76
	Tuntutuliak	65	46	45	1		157
	Eck	56	37	37			130
	Kasigluk	61	38	38	1	1	139
	Nunapitchuk	57	36	36			129
	Atmauthluak	39	25	25	1		90
	Napakiak	74	47	44	4		169
	Oscarville	8	6	6			20
	Napaskiak	43	26	26			95
	Bethel	344	163	166	12	71	756
	Kwethluk	88	66	65	1		220
	Akiachak	77	43	42	1		163
	Akiak	51	28	28	1		108
	Tuluksak	35	18	18	1		72
	Mekoryuk	2					2
	Anchorage	1				1	2
335-20	Kalskag	19	9	9	2	3	42
	Aniak	6	5	5	2	4	22
	Chuathbaluk	4	1	1	1	1	8
335-40	Quinhagak	111	77	76	1		265
335-50	Goodnews Bay	46	28	28	2		102
	Platinum	8	3	3	2		16
SUBTOTALS	335-10	1,071	618	615	24	73	2,401
	335-20	29	15	15	5	8	72
	335-40	111	77	76	1		265
	335-50	54	31	31	2		118
TOTALS		1,265	741	737	32	81	2,856

9/20

850 fishermen
899 permit

Table 8. Commercial and subsistence salmon catches by species and statistical area, Kuskokwim district, 1977.

Subdistrict	King	Red	Coho	Pink	Chum 1/	Total
335-10 Lower Kuskokwim						
Commercial	31,659	9,369	237,659	203	232,681	511,57
Subsistence 2/	39,470	-	7,576 3/	-	122,165	169,21
Total	71,129	9,369	235,235	203	354,846	680,78
335-20 Middle Kuskokwim						
Commercial	4,171	10	3,705	0	16,040	23,92
Subsistence 2/	13,967	-	1,982 3/	0	53,413	69,36
Total	18,138	10	5,687		69,453	93,28
335-30 Upper Kuskokwim						
Commercial	0	0	0	0	0	
Subsistence 2/	1,902	0	2,281 3/	0	22,777	26,96
Total	1,902		2,281		22,777	26,96
Subtotal Kuskokwim River						
Commercial	35,830	9,379	241,365	203	248,721	535,49
Subsistence 2/	55,339	-	11,839 3/	-	198,355	265,53
Total	91,169	9,379	253,204	203	447,076	801,03
335-40 Quinhagak						
Commercial	19,090	5,519	9,028	202	43,707	77,54
Subsistence 2/	2,012	-	182	-	4,186	6,38
Total	21,102	5,519	9,210	202	47,893	83,92
335-50 Goodnews Bay						
Commercial	3,336	3,723	13,335	29	6,531	26,95
Subsistence	574	-	182	-	856	1,61
Total	3,910	3,723	13,517	29	7,387	28,56
Total Kuskokwim District						
Commercial	58,256	18,621	263,728	434	298,959	639,99
Subsistence 2/	57,925	-	12,203	-	203,397	273,52
Total	116,181	18,621	275,931	434	502,356	913,52

1/ Subsistence catches contain small numbers of red and pink salmon.

2/ Expanded data.

3/ Minimal catches.

Table 9. Average weight of salmon taken in the Kuskokwim district commercial fishery, 1977. 1/

Subdistrict	Statistical Area	Average Weights by Species 2/ King	Red	Coho	Pink	Chum
Kuskokwim River:	335-10 335-20	22.5 (10.2)	7.3 (3.3)	7.6 (3.5)	4.2 (1.9)	6.9 (3.1)
Quinhagak:	335-40	22.1 (10.0)	8.0 (3.6)	8.2 (3.7)	3.6 (1.6)	7.8 (3.5)
Goodnews Bay:	335-50	22.4 (10.2)	8.0 (3.6)	9.3 (4.2)	3.7 (1.7)	7.9 (3.6)

1/ Data obtained from processor weights, randomly sampled.

2/ Pounds (kilograms).

Table 10. Commercial salmon catch data, lower Kuskokwim River (Subdistrict 1, Stat. Area 335-10), all gear combined, 1977.

Period Code	Date of Landing	Hours Open to Fishing	Fishermen	Fishermen Hours	Catch King	Catch Red	Catch Coho	Catch Pink	Catch Chum	Catch/Fisherman Hour King	Catch/Fisherman Hour Coho	Catch/Fisherman Hour Chum
	6/15	6										
1	Period	6	467	2,802	12,458	20			334	4.5		0.1
	6/20	6										
2	Period	6	484	2,904	16,227	18			1,715	5.6		0.6
	Subtotal 1/	12	563	5,706	28,685	38			2,049	5.0		0.4
	6/27	6										
3	Period	6	378	2,268	1,337	1,386			40,321	0.6		17.8
	6/30	6										
4	Period	6	409	2,454	504	3,655			58,884	0.2		24.0
	7/4	6										
5	Period	6	331	1,986	266	1,952		1	37,500	0.1		18.9
	7/7	6										
6	Period	6	368	2,208	407	1,799		1	56,943	0.2		25.8
	7/14	6										
7	Period	6	385	2,310	153	77	1		24,765	0.1	+	10.7
	Subtotal 2/	30	522	11,226	2,667	8,869	1	2	218,413	0.2	+	19.5
	8/1	18										
	8/2	6										
8	Period	24	360	8,640	91	392	23,987	34	7,157	0.0	2.8	0.8
	8/8	18										
	8/9	24										
	8/10											
9	Period	48	487	23,376	117	59	91,474	82	3,306	0.0	3.9	0.1
	8/15	18										
	8/16	6										
10	Period	24	438	10,512	57	4	60,935	15	1,161	0.0	5.8	0.1
	8/18	12										
11	Period	12	378	4,536	13	1	25,589	22	224	0.0	5.6	0.1
	8/22											
12	Period	12	361	4,332	12	6	16,980	21	202	0.0	3.9	0.1
	Subtotal 3/	144	572	57,012	307	462	237,658	201	12,219	0.0	4.2	0.2
	8/25	12										
13	Period	12	264	3,168	12		11,874	19	127	0.0	3.8	0.0
	8/29	12										
14	Period	12	204	2,448	5		6,819	8	42	0.0	2.8	0.0
	Subtotal 3/	144	572	57,012	307	462	237,658	201	12,219	0.0	4.2	0.2
	Grandtotal	186	653	73,944	31,659	9,369	237,659	203	232,681			

1/ King Salmon Season 6/15-6/20

2/ Chum Salmon Season 6/27-7/14

3/ Coho Salmon Season 8/1-8/29

Table 11. Commercial salmon catch data, lower Kuskokwim River downstream of Napakiak (Subdistrict 1, Stat. Area 335-11, all gear combined, 1977.

Period Code	Date of Landing	Hours Open to Fishing	Fishermen	Fishermen Hours	Catch					Catch/Fishermen Hour		
					King	Red	Coho	Pink	Chum	King	Coho	Chum
	6/15	6										
1	Period	6	263	1,578	6,669	17			206	4.2		0.1
	6/20	6										
2	Period	6	236	1,416	6,692	11			732	4.7		0.5
	Subtotal 1/	12	322	2,994	13,361	28			938	4.5		0.3
	6/27	6										
3	Period	6	378	2,268	1,337	1,386			40,321	0.6		17.8
	6/30	6										
4	Period	6	409	2,454	504	3,655			58,884	0.2		24.0
	7/4	6										
5	Period	6	331	1,986	266	1,952		1	37,500	0.1		19.0
	7/7	6										
6	Period	6	368	2,208	407	1,799		1	56,943	0.2		25.8
	7/14	6										
7	Period	6	385	2,310	153	77	1		24,765	0.1	0.0	10.7
	Subtotal 2/	30	522	11,226	2,667	8,869	1	2	218,413	0.2	0.0	19.5
	8/1	18										
	8/2	6										
8	Period	24	196	4,704	42	121	9,909	31	1,958	0.0	2.1	0.4
	8/18	18										
	8/9	24										
	8/10	6										
	Period	48	288	13,824	51	35	44,067	40	1,286	0.0	3.2	0.1
	8/15	18										
	8/16	6										
10	Period	24	200	4,800	17	4	25,316	5	302	0.0	5.3	0.1
	8/18	12										
11	Period	12	152	1,824	5		9,633	18	47	0.0	5.3	0.0
	8/22	12										
12	Period	12	180	2,160	10	6	6,872	14	70	0.0	3.2	0.0
	Subtotal 3/	210	351	35,112	118	1	44,750	24	1,628	0.0	1.3	0.0
	8/25	12										
13	Period	12	99	1,188	3		3,901	12	23	0.0	3.3	0.0
	8/29	12										
14	Period	12	58	696	1		1,740	1	3	0.0	2.5	0.0
	Subtotal 3/	144	358	29,196	129	166	101,438	121	3,689	0.0	3.5	0.1
	Grandtotal	186	585	43,416	16,157	9,063	101,439	123	223,040			

1/ King Salmon Season 6/15-6/20

2/ Chum Salmon Season 6/27-7/14

3/ Coho Salmon Season 8/1-8/29

ble 12. Commercial salmon catches, lower Kuskokwim River upstream of Napakiak (Subdistrict 1, Stat. Area 3[illegible]), all gear combined, 1977.

Period Code	Date of Landing	Hours Open to Fishing	Fishermen	Fishermen Hours	Catch					Catch/Fishermen Hour		
					King	Red	Coho	Pink	Chum	King	Coho	Chum
	6/15	6										
1	Period	6	212	1,272	5,789	3			128	4.6		0.1
	6.20	6										
2	Period	6	250	1,500	9,535	7			983	6.4		0.7
	Subtotal 1/	12	286	2,772	15,324	10			1,111	5. 5		0.4
	8/1	18										
	8/2	6										
8	Period	24	202	4,848	49	271	14,078	3	5,199	0.0	2.9	1.1
	8/8	18										
	8/9	24										
	8/10	6										
9	Period	48	264	12,672	66	24	47,407	42	2,020	0.0	3.7	0.2
	8/15	18										
	8/16	6										
10	Period	24	267	6,408	40		35,619	10	859	0.0	5.6	0.1
	8/18	12										
11	Period	12	229	2,748	8	1	15,956	4	177	0.0	5.8	0.1
	8/22	12										
12	Period	12	188	2,256	2		10,108	7	132	0.0	4.5	0.1
	Subtotal 2/	210	362	40,668	123	3	43,139	29	1,538	0.0	1.1	0.0
	8/25	12										
13	Period	12	175	2,100	9		7,973	7	104	0.0	3.8	0.1
	8/29	12										
14	Period	12	146	1,752	4		5,079	7	39	0.0	2.9	0.0
	Subtotal 2/	144	396	32,784	178	296	136,220	80	8,530	0.0	4.2	0.3
	Grandtotal	156	433	35,556	15,502	306	136,220	80	9,641			

King Salmon Season 6/17-6/21

Coho Salmon Season 8/2-8/31

Table 13. Commercial salmon catch data, upper Kuskokwim River (Subdistrict 2, Stat. Area 335-20), all gear combined, 1977.

Period	Code	Date of Landing	Hours Open to Fishing	Fishermen	Fishermen Hours	Catch King	Red	Coho	Pink	Chum	Catch/Fishermen Hour King	Coho	Chum
		6/20	6										
		6/21	6										
1		Period 1/	30	83	2,490	3,975				756	1.6		0.3
		7/4	6										
		7/5	6										
2		Period 2/	12	54	648	195	10			15,160	0.3		23.4
		8/15	12										
3		Period 3/	12	24	288	1		3,705		124	+	12.9	0.4
		Grandtotal	54	105	3,426	4,171	10	3,705		16,040	1.2	1.1	4.7

1/ King Salmon Season 6/20-6/21

2/ Chum Salmon Season 7/4-7/15

3/ Coho Salmon Season 8/15

Table 14. Age and sex composition of Kuskokwim district King Salmon sampled at various locations, 1977.

Area (gear)	Combined Age Classes Sex	No.	%	Age 3_2 No.	%	Age 4_2 No.	%	Age 5_2 No.	%	Age 6_2 No.	%	Age 7_2 No.	%	Unknown Age No.	%
Kwegooyuk 2/ (8-1/2" mesh set gillnet)	Male	310	50.3			4	0.6	140	22.7	162	26.4	4	0.6		
	Female	306	49.7			0	0.0	60	9.7	237	28.5	9	1.5		
	Total	616	100.0			4	0.6	200	32.4	399	69.4	13	2.1		
Bethel 1/ (8-1/2" mesh gillnet)	Male	149	63.1			2	0.8	62	26.3	83	35.2	2	0.8		
	Female	87	36.9			6	2.5	10	4.2	64	27.1	7	3.0		
	Total	236	100.0			8	3.3	72	30.5	147	62.3	9	3.8		
Quinhagak 1/ (6" mesh gillnet)	Male	246	51.3			16	3.3	131	27.3	98	20.4	1	0.2		
	Female	234	48.8			0	0.0	65	13.5	164	34.2	5	1.0		
	Total	480	100.1			16	3.3	196	40.8	262	54.6	6	1.2		
Holitna Wier 3/	Male	551	39.8	11	0.8	50	3.6	195	14.1	285	20.6	0	0.0	10	0.7
	Female	834	60.2	0	0.0	0	0.0	107	7.7	725	52.3	0	0.0	2	0.1
	Total	1,385	100.0	11	0.8	50	3.6	302	21.8	1,010	72.9	0	0.0	11	0.8

1/ Commercial catch sample

2/ Test fish samples

3/ Weir sample

Table 15. Kuskokwim District Subsistence Fishery Data, 1977.

Village	Families	People	Dogs	Snow Machines	Estimated Salmon Catch 1/ King	Small Salmon 2/	Coho 3/	8 1/2" Nets	5 1/2" Nets	Fish Wheels
Kwigillingok	8	69	13	16	382	1,595	0	10	10	0
Kongigonak	8	53	19	14	361	595	0	7	8	0
Eek	31	183	81	43	2,675	1,286	1,965	32	37	0
Tuntutuliak	33	196	103	54	2,470	9,109	231	35	40	0
Kasigluk	34	250	102	52	1,324	3,504	0	26	29	0
Nunapitchuk	27	218	136	67	2,622	8,991	0	33	37	0
Atmautluak	22	134	72	32	1,015	3,319	374	32	24	0
Napakiak	32	210	134	45	2,702	7,945	475	38	37	0
Oscarville	8	41	25	9	672	1,910	120	8	6	0
Napaskiak	22	146	41	30	1,989	11,588	-	22	22	0
Bethel	116	706	319	115	9,408	14,957	1,025	124	109	0
Kwethluk	57	377	280	70	5,563	25,405	2,788	60	66	0
Akiachuk	43	331	132	67	5,407	18,233	374	54	56	0
Akiak	26	156	266	35	2,880	13,728	224	32	31	0
Tuluksak	20	151	112	34	2,906	7,575	260	25	23	0
Lower Kalskag	22	118	108	25	1,750	7,886	1,078	18	23	0
Upper Kalskag	19	122	86	28	2,813	11,720	125	19	18	0
Aniak	29	150	99	36	4,991	21,256	354	29	28	0
Chauthbaluk	11	67	37	25	1,507	4,976	165	9	2	2
Napamute	4	21	12	7	176	4,892	77	3	4	0
Georgetown	1	13	8	2	66	1,095	32	0	1	0
Crooked Creek	12	52	26	7	619	2,934	138	4	13	1
Red Devil	6	36 4/	24 4/	3 4/	324	5,445	471	1	6	1
Sleetmute	16	88	67	15	684	5,111	1,563	3	15	0
Stony River	7	57	60	12	33	3,300	0	0	8	4
Lime Village	4	18	--	--	- -	- -	- -	-	-	1
Totals	629	3,963	2,362	843	55,339	198,355	11,839	624	653	9
Quinhagak	60	397	100	87	2,012	4,186	182	-	-	0
Goodnews Bay	26	148	64	23	574	856	182	-	-	0
Kuskokwim District TOTALS	715	4,508	2,526	953	57,925	203,397	12,203	-	-	9

1/ Expanded data.

2/ Mostly chums with lesser number of red, pink and small king salmon.

3/ Data is very fragmented and minimal.

4/ Estimated numbers.

le 16. Commercial salmon catch data, Quinhagak (Subdistrict 4, Stat. Area 335-40), all gear combined, 1977.

Period Code	Date of Landing	Hours Open to Fishing	Fishermen	Fishermen Hours	Catch King	Red	Coho	Pink	Chum	Catch/Fishermen Hour King	Red	Coho	Chum
	6/16	6											
	6/17	6											
1	Period	12	67	804	3,021	149			87	3.8	0.2		0.1
	6/21	6											
	6/22	6											
2	Period	12	90	1,080	3,381	427			364	3.1	0.4		0.3
	6/23	6											
	6/24	6											
3	Period	12	171	2,052	5,326	933			2,043	2.6	0.5		1.0
	6/27	6											
	6/28	6											
4	Period	12	102	1,224	4,719	1,119		2	3,766	3.9	0.9		3.1
	7/4	6											
	7/5	6											
5	Period	12	96	1,152	1,291	830		5	6,841	1.1	0.7		5.9
	7/7	6											
	7/8	6											
6	Period	12	84	1,008	313	914		21	5,076	0.3	0.9		5.0
	7/11	6											
	7/12	6											
7	Period	12	172	2,064	488	412		13	8,755	0.2	0.2		4.2
	7/14	6											
	7/15	6											
8	Period [1]	12	85	1,020	229	320		54	5,450	0.2	0.3		5.3
	7/18	6											
	7/19	6											
9	Period	12	115	1,380	106	139	3	53	5,112	0.1	0.1	+	3.7
	7/21	6											
	7/22	6											
10	Period	12	101	1,212	75	91	4	52	4,584	0.1	0.1	+	3.8
	7/25	6											
	7/26	6											
11	Period	12	15	180	38	28	49		485	0.2	0.2	0.3	2.7
	7/28	6											
	7/29	6											
12	Period	12	40	480	27	42	247	2	360	0.1	0.1	0.5	0.8
	8/1	6											
	8/2	6											
13	Period [2]	12	32	384	15	51	182		257	+	0.1	0.5	0.7
	8/4	12											
14	Period	12	36	432	16	35	1,012		226	+	0.1	2.3	0.5
	8/8	12											
15	Period	12	27	324	8	11	547		65	+	+	1.7	0.2
	8/11	12											
16	Period	12	24	288	7	8	719		61	+	+	2.5	0.2
	8/15	12											
17	Period	12	31	372	8	5	1,222		34	+	+	3.3	0.1
	8/17	12											
18	Period	12	38	456	1	1	882		47	+	+	1.9	0.1
	8/19	12											
19	Period	12	42	504	5		1,237		27	+		2.5	0.1
	8/22	12											
20	Period	12	23	276	12	2	920		36	+	+	3.3	0.1
	8/24	12											
21	Period	12	34	408	1	2	824		22	+	+	2.0	0.1
	8/26	12											
22	Period	12	7	84	2		278		7	+		3.3	0.1
	8/29	12											
23	Period	12	18	216	1		501			+		2.3	
	8/31	12											
24	Period	12	16	192			401		2	+		2.1	+
	9/2	12											
25	Period	12	0	0		NO BUYER							
	9/5	12											
26	Period	12	0	0		NO BUYER							
	9/7	12											
27	Period	12	0	0		NO BUYER							
	Grandtotal	324	258	17,592	19,090	5,519	9,028	202	43,707				

ing salmon season considered ended when catches show definite decrease.

[1] Coho salmon season 8/1-9/7

'e 17. Commercial salmon catch data, Goodnews Bay (Subdistrict 5, Stat. Area 335-50), all gear combined, 1977.

Period Code	Date of Landing	Hours Open to Fishing	Fishermen	Fishermen Hours	Catch					Catch/Fishermen Hour			
					King	Red	Coho	Pink	Chum	King	Red	Coho	Chum
	6/16	6											
	6/17	6											
1	Period	12	12	144	147	52			7	1.0	0.4		0.1
	6/20	6											
	6/21	6											
2	Period	12	18	216	348	239			58	1.6	1.1		0.3
	6/23	6											
	6/24	6											
3	Period	12	17	204	642	348			160	3.2	1.7		0.8
	6/27	6											
	6/28	6											
4	Period	12	20	240	1,026	669		1	355	4.3	2.8		1.5
	6/30	6											
	7/1	6											
5	Period	12	19	228	370	422		5	404	1.6	1.9		1.8
	7/4	6											
	7/5	6											
6	Period	12	18	216	341	405		7	856	1.6	1.9		4.0
	7/7	6											
	7/8	6											
7	Period	12	7	84	63	179			913	0.8	2.1		10.9
	7/11	6											
	7/12	6											
8	Period	12	9	108	126	371		8	428	1.1	3.4		4.0
	7/14	6											
	7/15	6											
9	Period	12	10	120	169	195		8	498	1.4	1.6		4.2
	7/18	6											
	7/19	6											
10	Period	12	21	252	23	211			986	0.1	0.8		3.9
	7/21	6											
	7/22	6											
1	Period	12	19	228	49	284			965	0.2	1.3		4.2
	7/25	6											
	7/26	6											
12	Period	12	DID NOT FISH										
	7/28	6											
	7/29	6											
13	Period	12	9	108	5	47	5	3	151	0.1	0.4	0.1	1.4
	8/1	6											
	8/2	6											
14	Period	12	14	168	4	83	21	2	112	0.0	0.5	0.1	0.7
	8/4	6											
	8/5	6											
15	Period	12	5	60	2	16	136		133	0.0	0.3	2.3	2.2
	8/8	6											
	8/9	6											
16	Period	12	17	204	7	74	538		134	0.0	0.4	2.6	0.7
	8/11	6											
	8/12	6											
17	Period	12	18	216	8	52	1,039		181	0.0	0.2	4.8	0.8
	8/15	6											
	8/16	6											
18	Period	12	19	228	4	43	1,741		123	0.0	0.2	7.6	0.5
	8/17	6											
	8/18	6											
19	Period	12	18	216	2	30	2,250		47	0.0	0.1	10.4	0.2
	8/19	6											
	8/20	6											
20	Period	12	14	168		3	2,024		15		0.0	12.1	0.1
	8/22	6											
	8/23	6											
21	Period	12	DID NOT FISH										
	8/24	6											
	8/25	6											
22	Period	12	DID NOT FISH										
	8/26	6											
	8/27	6											
23	Period	12	15	180			2,542					14.1	
	8/29	6											
	8/30	6											
	Period	12	16	192			3,039	3	5			15.8	0.0
	Grandtotal	288	34	3,780	3,336	3,723	13,335	29	6,531				

Table Aerial salmon escapement survey in the Kusk[illegible]n district, 1977.

	Survey Conditions	Date	Kings	Reds	Cohos	Pinks	Chums
KUSKOKWIM BAY							
Goodnews River System							
Main river mouth to lake	good	7-22-77	2,163	4,271			15,993
Goodnews Lake	poor	7-22-77		925			
Inlet to Goodnews Lake	good	7-22-77		5,680			
Middle-fork Goodnews Lake							
Kukaktlim Creek	fair	7-22-77	98	60			
Kukaktlim Lakes	fair	7-22-77		1,510			
Kanektok River System							
Kanektok mouth to Nukluk Creek	fair	7-21-77	3,097	4,782			30,315
Nukluk Creek to Kanuktik Creek	good	7-21-77	2,477	1,387			1,787
Kanuktik Creek to Lake Kagati	good	7-21-77	213	135			55
Kagati Lake	fair	7-21-77		840			
KUSKOKWIM RIVER							
Aniak River System							
Aniak River - 5 mi. below lake to canyon below Gernuk Mt.	fair	7-21-77	21				
Kipchuk River - canyon downstream 5 mi.	poor	7-21-77	16				
Salmon River - mouth to Marvel Creek	fair	8-09-77	625				
Eek River							
5 mi. section 20 mi. below Eek Lake	fair	7-21-77	258				
Holitna River System							
Kogrukluk River	fair	7-23-77	1,342	614			606

Holak River				
Mouth to Chineekluk Creek	good	8-09-77	41	9,340
Kasigluk River System				
Kasigluk River first cutoff to second cutoff	fair	8-07-77		10,340
Second cutoff to Little Kasigluk River	fair	8-07-77	5	3,200
Little Kasigluk to canyon	fair	8-07-77	2	374
Little Kasigluk River - 4 airmiles upstream from mouth	poor	7-20-77	10	
Kwetkluk River				
Three Step Mt. to Elbow Mt.	fair	7-22-77	753	16,540
Elbow Mt. to Canyon Creek	fair	7-22-77	1,246	3,081
Oskawalik River				
Entire	fair	7-22-77	277	8,682
MIDDLE FORK KUSKOKWIM RIVER SYSTEM				
Pitka Fork	good	9-09-77		5,700
Salmon River				
Left fork	good	7-23-77	433	
Right fork	good	7-23-77	1,347	50
Middle fork	good	7-23-77	150	
Stony River				
Can Creek	fair	7-23-77	14	4,770
Swift River				
Cheeneetnuk River	good	7-22-77	1,407	473
Cheeneetnuk River	fair	8-09-77	43	880
Tagaryak River	good	7-23-77	897	100

Tatl ouk River				
Mouth to foothills	poor	7-22-77	6	3,920
Foothills to 1,465 ft. peak	poor	7-22-77	183	2,510
Tuluksak River				
Mouth to NYAC	good	7-21-77	424	2,069
Above NYAC	good	7-21-77	15	

Appendix Table 1. Kuskokwim district commercial and subsistence salmon catches, 1913-1977.

	Commercial Catch						Subsistence Catch[1]		
Year	King	Red	Coho	Pink	Chum	Total	King	Other Salmon[2]	Total
1913	7,800					7,800			
1914		2,667				2,667			
1915									
1916	949					949			
1917	7,878					7,878			
1918	3,055					3,055			
1919	4,836					4,836			
1920	34,853					34,853			
1921	9,854					9,854			
1922	8,944	6,120				15,064			180,000
1923	7,254					7,254			
1924	19,253	900	7,167		7,167	34,487	14,700	203,148	217,848
1925	1,664	5,800				7,514	10,800	230,850	241,650
1926								738,576	738,576
1927								286,254	286,254
1928								481,090	481,090
1929								560,196	560,196
1930	7,515	2,448				9,963		538,650	538,650
1931	8,541					8,541		389,367	389,367
1932	9,339					9,339		746,415	746,415
1933							6,290	433,998	440,288
1934							20,800	597,132	617,932
1935	6,448		8,296			14,744	22,930	554,040	576,970
1936	624					624	33,500	549,423	582,923
1937	480					480		537,111	537,111
1938	624		828			1,452	10,153	400,242	410,395
1939	134					134	14,000	125,425	139,425
1940	247		500			747	8,000	415,523	423,523
1941	187		674			861	8,000	415,523	423,523
1942							6,400	325,339	331,739
1943							6,400	325,800	332,200

1946	2,288		674			2,962			
1947	5,356					5,356			

1951	4,210					4,210			
1954	57					57			
1959	3,760					3,760			
1960	5,969	5,649	5,498		3	17,119	20,361	327,297	347,658
1961	23,246	2,308	5,090	91	18,864	49,599	30,910	185,447	216,357
1962	20,867	10,313	12,598	4,340	45,707	93,831	14,642	165,626	180,268
1963	18,571		15,660			34,231	37,246	141,550	178,796
1964	21,230	13,422	28,992	939	707	65,290	30,853	214,942	245,795
1965	24,965	1,886	12,191		4,242	43,284	31,143	323,002	354,145
1966	25,823	1,030	22,985	268	2,610	52,716	53,606	201,002	254,608
1967	29,986	652	58,239		8,235	97,112	61,224	252,447	313,671
1968	43,157	5,884	154,302	75,818	19,694	298,845	34,986	301,531	336,517
1969	64,777	10,362	110,473	1,251	50,377	237,240	43,732	245,299	289,031
1970	65,082	12,654	62,245	27,422	60,566	227,979	71,376	263,746	335,112
1971	44,936	6,054	10,006	13	99,423	160,432	45,465	130,329	175,794
1972	55,482	4,312	23,880	1,952	97,197	182,823	43,335	131,514	174,849
1973	51,374	5,224	152,408	634	184,207	393,847	41,697	211,468	253,165
1974	30,670	29,003	179,579	60,052	196,127	495,431	29,590	321,358	350,848
1975[3]	27,799	17,535	109,314	899	223,532	379,579	51,045	180,429	231,474
1976	49,262	14,636	112,130	39,998	231,877	447,903	60,335	235,488	295,823
1977	58,256	18,621	263,728	434	298,959	639,998	57,925	215,600	273,525
Previous 5-yr.ave.	42,917	14,142	115,562	20,707	186,588		45,200	216,051	

1/ Subsistence catches for 1960-1976 have been revised and corrected.
2/ Primarily chum salmon.
3/ Final catch data used.

Appendix Table 2. Kuskokwim district commercial, vessel, and gear licenses issued by subdistrict, 1970-1977

Commercial Year	335-10	335-20	335-40	335-50	Other	Total
1970	488	6	60	46		600
1971	551	24	51	28		654
1972	512	14	66	21		613
1973	646	15	61	24		746
1974	965	26	98	49		1,138
1975	940	11	90	58		1,099
1976	987	22	94	42		1,145
1977	1,171	29	111	54		1,265
Previous 5-yr. ave.	810	18	82	39		949

Vessel Year	335-10	335-20	335-40	335-50	Tender	Other	Total
1970	373	5	53	37	11		479
1971	440	19	46	27	16		548
1972	428	13	53	18	8		520
1973	474	14	52	18	16		558
1974	738	17	89	39	22		905
1975	642	9	79	44	30		804
1976	657	14	76	32	47		826
1977	618	15	77	31	81		822
Previous 5-yr. ave.	588	13	70	30	25		726

Set Net Year	335-10	335-20	335-40	335-50	Other	Total
1970	38	3		35		76
1971	49	4		18		71
1972	38	4		1		43
1973	18	6		1		25
1974	54	9		7		70
1975	38	1		9		48
1976	21	2				23
1977	24	5		2		32
Previous 5-yr. ave.	34	4		4		42

Drift Net Year	335-10	335-20	335-40	335-50	Other	Total
1970	355	2	53	36	1 1/	447
1971	412	16	46	27		501
1972	416	11	53	18		498
1973	471	13	52	18		554
1974	712	15	87	39		853
1975	655	8	79	42		784
1976	660	13	75	30		778
1977	615	15	76	31		737
Previous 5-yr. ave.	583	12	69	29		693

1/ One herring seine.

Appendix Table 3. Kuskokwim district commercial catches by drainage, 1960-1977.

Kuskokwim River[1/]	King	Red	Coho	Pink	Chum	Total
1960	5,969	0	2,498	0		8,467
1961	18,918	0	5,044	0		23,962
1962	15,341	0	12,432	0		27,773
1963	12,016	0	15,660	0		27,676
1964	17,149	0	28,613	0		45,762
1965	21,989	0	12,191	0		34,180
1966	25,545	0	22,985	0		48,530
1967	29,986	0	56,313	0	148	86,447
1968	34,278	0	127,306	0	187	161,771
1969	43,997	322	83,765	0	7,165	135,249
1970	39,290	117	38,601	44	1,664	79,716
1971	40,274	2,606	5,253	0	68,914	117,047
1972	39,454	102	22,579	8	78,619	140,762
1973	32,838	369	130,876	33	148,746	312,862
1974	18,664	136	147,260	37	171,887	337,984
1975[4/]	21,720	23	81,945	10	181,840	285,538
1976	30,735	2,971	88,501	133	177,864	300,204
1977	35,380	9,379	241,364	203	248,721	535,497
Previous 5 year average	28,682	720	94,232	44	151,791	275,470
Quinhagak (Kanektok R.)[2/]	**King**	**Red**	**Coho**	**Pink**	**Chum**	**Total**
1960	0	5,649	3,000	0	0	8,649
1961	4,328	2,308	46	90	18,864	25,636
1962	5,526	10,313	0	4,340	45,707	65,886
1963	6,555	0	0	0	0	6,555
1964	4,081	13,422	379	939	707	19,528
1965	2,976	1,886	0	0	4,242	9,104
1966	278	1,030	0	268	2,610	4,186
1967	0	652	1,926	0	8,087	10,665
1968	8,879	5,884	21,511	75,818	19,497	131,589
1969	16,802	3,784	15,077	953	38,206	74,822
1970	18,629	5,393	16,850	15,195	46,556	102,623
1971	4,185	3,118	2,982	13	30,208	40,506
1972	15,880	3,286	376	1,878	17,247	38,667
1973	14,993	2,783	16,515	277	19,680	54,248
1974	8,704	19,510	10,979	43,642	15,298	98,133
1975[4/]	3,928	8,584	10,742	486	35,233	58,973
1976	14,110	6,090	13,777	31,412	43,659	109,048
1977	19,090	5,519	9,028	202	43,707	77,546
Previous 5 year average	11,523	8,051	10,478	15,539	26,223	71,814
Goodnews Bay (Goodnews R.)[3/]	**King**	**Red**	**Coho**	**Pink**	**Chum**	**Total**
1968			5,485			5,485
1969	3,978	6,256	11,631	298	5,006	27,169
1970	7,163	7,144	6,974	12,346	12,346	45,630
1971	477	330	1,771	0	301	2,879
1972	264	924	925	66	1,331	3,510
1973	3,543	2,072	5,017	324	15,781	26,737
1974	3,302	9,357	21,340	16,373	8,942	59,314
1975[4/]	2,151	8,928	17,127	403	6,459	35,068
1976	4,417	5,575	9,852	8,453	10,354	38,651
1977	3,336	3,723	13,335	29	6,531	26,943
Previous 5 year average	2,725	5,371	10,852	5,124	8,573	32,656

1/ Includes subdistricts 335-10, 335-20 and 335-30. Commercial fishing in 335-30 has been prohibited since 1966.
2/ Subdistrict 335-40
3/ Subdistrict 335-5- and includes Chagvan Bay
4/ Final catch data used.

Appendix Table 4. Comparable commercial king salmon catch data, Kuskokwim district, 1960-1977.

Total catch Year	335-10[1/]	335-20[1/]	335-30	335-40	335-50	335-60	Total
1960	2,927	1,231	1,811	0			5,969
1961	15,820	1,551	1,547	4,328			23,246
1962	13,306	2,035	0	5,526			20,867
1963	9,095	2,921	0	6,555			18,571
1964	15,754	1,395	0	4,081			21,230
1965	21,452	537	0	2,976			24,965
1966	25,212	333	0	278			25,823
1967	29,367	615		0			29,986
1968	33,451	826		8,879	0		43,157
1969	43,141	853		16,802	3,978	7	64,777
1970	37,715	1,463		18,629	7,163		65,082
1971	35,421	2,439		4,185	477		44,936
1972	37,699	1,755		15,880	264		55,482
1973	28,194	2,244		14,993	3,543		51,374
1974	16,031	951		8,704	3,302		30,670
1975	18,235	1,319		3,928	2,149		27,799
1976	20,010	3,316		14,110	4,417		49,262
1977	28,685	3,975		19,090	3,336		55,086
78	36139						
5 year average	24,034	1,906		11,523	2,712		

1/ King salmon season only.

Appendix Table 5. Commercial salmon pack by species in round weight (lbs), Kuskokwim district, 1968 - 1977.[1/]

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Fresh or frozen										
king	794,682	1,032,863	1,113,890	801,628	1,400,243	1,371,685	566,941	159,845	935,652	1,326,773
red	36,480	25,351	68,116	30,635	4,319	37,816	179,768	108,216	95,761	154,706
coho	1,090,690	322,254	453,125	64,457	152,832	883,966	1,245,132	670,598	809,916	2,009,171
pink	303,270	3,413	90,703		6,442	2,092	246,134	2,809	133,911	1,678
chum	146,230	249,007	367,715	678,173	631,781	1,252,607	1,220,496	1,350,936	1,609,718	2,185,549
Salmon roe, (lbs. of finished product.)	2/	56,926	42,958	64,136	62,963	165,574	2/	43,113	120,405[3/]	109,105[3/]
Subsistence roe (lbs. of raw product).									157,151	167,155

1/ Pack represents type of processing when fish were shipped out of district.
2/ Information not available.
3/ Raw product

Appendix Table 6. Mean salmon weights and prices paid to fishermen, Kuskokwim district, 1964-1977.

Year	Mean weights-lbs.(kgs) King	Coho	Red	Pink	Chum
1964	23.2 (10.5)	6.5 (3.0)	5.8 (2.6)		6.1 (2.8)
1965	21.7 (9.9)	6.5 (3.0)	6.6 (3.0)		
1966	23.2 (10.5)	6.7 (3.0)			
1967	27.8 (12.6)	5.9 (2.7)	7.4 (3.4)		7.0 (3.2)
1968	23.8 (10.8)	7.2 (3.3)	6.2 (2.8)	4.0 (1.8)	7.9 (3.6)
1969	19.6 (8.9)	7.3 (3.3)	6.2 (2.8)	3.6 (1.6)	5.8 (2.6)
1970	18.9 (8.6)	7.3 (3.3)	5.4 (2.5)	3.3 (1.5)	6.1 (2.8)
1971	26.2 (11.9)	6.1 (2.8)	6.91 (3.1)	2/	6.4 (2.9)
1972	24.7 (11.2)	6.4 (2.9)	2/	2/	6.5 (3.0)
1973	26.7 (12.1)	5.8 (2.6)	2/	2/	6.8 (3.1)
1974	17.1 (7.7)	7.5 (3.4)	6.3 (2A)	4.1 (1.9)	6.8 (3.1)
1975	14.9 (6.8)	8.2 (3.7)	2/	2/	6.4 (2.9)
1976	17.0 (7.7)	7.8 (3.5)	6.7 (3.0)	3.5 (1.6)	7.0 (3.2)
1977	22.7 (10.3) 24.4	7.3 (3.5)	8.3 (3.8)	3.9 (1.8)	7.3 (3.3)

Year	Mean prices (per fish) King	Coho	Red	Pink	Chum
1964	$ 3.25 .14	$ .35	$ .50	$	$
1965 1/					
1966	3.00 .13	.40 .06	.50	.10	.10
1967	3.55	.52	.40		.25
1968	3.74	.67	.60	.20	.35
1969	3.80	.76	.91	.22	.43
1970 3/	3.78	1.03	1.15	.26	.51
1971	4.53	.82	.71	2/	.50
1972	4.92	1.00	.88	.25	.54
1973	6.83	1.50	2.32	.53	1.28
1974	7.96	2.00	2.15	.93	1.71
1975	8.05 .54	2.54	2/	2/	1.67
1976	10.82 .44	3.12 4/	2.85	.88	1.89
1977	26.11 1.15 .53	5.07	3.74 .41	.98	3.29

1/ Samples available only for two periods - 7/1-2 - 7/5-6.
2/ Information unavailable
3/ Information not available for 335-50 (Goodnews) only fished one day.
4/ Information not available for 335-40 (quinhagak).

Appendix Table 7. Dollar value estimates of Kuskokwim district commercial fishery, 1964-1977 1/

Year	Gross Value of catch to fishermen	Wages earned 2/	Total income to district	Wholesale value of pack 3/	Tax revenue to state
1964	$ 83,030.00	$	$	$ 409,700.00	$ 6,100.00
1965	90,950.00			370,000.00	8,200.00
1966	87,466.00			406,500.00	8,100.00
1967	138,647.00	20,000.00	158,647.00	727,000.00	
1968	290,370.00	40,000.00+	330,370.00+	1,135,000.00	17,000.00
1969	297,233.00	60,435.00+	357,668.00+		
1970	362,470.00	127,327.00	489,797.00	1,300,000.00	20,000.00
1971	371,220.00	80,510.00	451,730.00	672,180.00	16,770.00
1972	360,727.00	86,895.00	447,622.00		
1973	827,735.00	150,000.00+	977,735.00	3,600,000.00	32,000.00
1974	1,056,042.00	150,000.00+	1,206,042.00		
1975	899,178.00	165,000.00+	1,064,178.00	2,000,000.00	25,000.00
1976	1,380,229.00	175,000.00 +	1,555,229.00		
1977	3,891,950.00	200,000.00 +	4,091,950.00		

1/ Information not available for wages earned during 1964-1966.
2/ Includes wages paid to tenderboat operators, processing plant employees in district.

Appendix Table 8 Total utilization of Kuskokwim River king salmon, 1960-1977.

Year	Commercial Catch 1/	Subsistence Catch 2/	Total Utilization
1960	5,969	20,361	26,330
1961	18,918	30,910	49,828
1962	15,341	14,642	29,983
1963	12,016	37,246	49,262
1964	17,149	29,017	46,166
1965	21,989	27,143	49,132
1966	25,545	49,606	75,151
1967	29,986	57,875	87,861
1968	34,278	30,230	64,508
1969	43,997	40,138	84,135
1970	39,290	69,204	108,494
1971	40,274	42,926	83,200
1972	39,454	40,145	79,599
1973	32,838	38,526	71,365
1974	18,664	26,665	45,329
1975	21,720	47,784	69,504
1976	30,735	57,917	88,652
1977	35,830	55,339	91,169
1978			
Previous 5 yr. average	28,682 (27957)	42,207 (45,246)	70,889 73,203

1/ Subdistricts 335-10, 335-20 and 335-30 to the Swift River.

2/ Catches are expanded and include all villages surveyed each year. Data includes a few villages not included in comparative catch tables.

Appendix Table 9. Comparative commercial king salmon catch data by fishing period during the king salmon season, Kuskokwim River (subdistrict 1, 335-10), 1970-1977.

	1970			1971			1972			1973		
Fishing periods (1974)	Catch	Boats	C.F.H.	Catch	Boats	C.F.H.	Catch	Boats	C.F.H.	Catch	Boats	C.F.H.
June												
4-6	3,045	172	0.74									
6-9	7,836	275	1.19							2,752	209	1.09
10-13 (10-11)	13,485	320	1.76							7,419	348	1.78
13-16 (13-14)	13,349	313	3.55 1/	2,436	148	1.37	2,735	184	1.24	7,606	334	1.90
16-20 (17-18)				11,029	306	3.00	8,535	239	2.98	10,417	372	2.33
20-23				12,337	355	2.90	14,356	341	2.34			
23-25				9,619	309	2.59	12,073	297	1.69			
27-28												
Totals	37,715	361	1.70	35,421	418	2.64	37,699	405	2.05	28,194	456	1.86
Associated data												
Fishermen hours		22,164			13,416			18,342			15,156	
Days open to fishing 2/		3 1/2			2			2 3/4			2	
Kuskokwim River												
Breakup (Bethel)		May 12			May 24			May 23			May 14	
Kuskokwim clear of ice		May 16			May 29			May 28			May 18	
First king salmon		May 21			June 6			June 5			May 27	
Smelt at Bethel		May 27			June 7			June 6			May 31	
First frost		Sept. 7			Sept. 7			Sept. 16			Aug. 13	
Freezeup at Bethel		Oct. 18			Nov. 4			Nov. 3			Oct. 15	

	1974			1975			1976			1977		
Fishing periods (1974)	Catch	Boats	C.F.H.	Catch	Boats	C.F.H.	Catch	Boats	C.F.H.	Catch	Boats	C.F.H.
June												
4-6												
6-9												
10-13 (10-11)	4,384	422	0.9									
13-16 (13-14)	5,790	488	1.0	381	11	5.7				12,458	467	4.5
16-20 (17-18)	5,857	506	1.0	991	40	2.1	6,962	459	2.5	16,227	484	5.6
20-23				16,863	463	3.0	13,048	495	4.4			
23-35												
27-28												
Totals	16,031	606	0.9	18,235	472	3.0	20,010	561	3.5	28,685	563	5.0
Associated Data												
Fishermen hours		16,922			6,102			5,724			5,706	
Days open to fishing 2/		1 1/2			1 1/4			1/2			1/2	
Kuskokwim River												
Breakup (Bethel)		May 7			May 19			May 18			May 23	
Kuskokwim River Clear of ice		May 19			May 25			May 28			June 1	
First king salmon		May 23			May 26			±June 1			May 31	
Smelt at Bethel		May 25			May 29						June 2	
First frost												
Freezeup at Bethel					Oct. 29			Oct. 27			Oct. 18	

1/ Open for only 12 hours

Appendix Table 10 Total utilization of Kuskokwim River chum salmon, 1960-1977 3/

Year	Commercial Catch 1/	Subsistence Catch 2/	Total Utilization
1960		327,297	327,297
1961		185,447	185,447
1962		165,626	165,626
1963		141,550	141,550
1964		189,660	189,660
1965		283,459	283,459
1966		174,660	174,660
1967	148	205,263	205,411
1968	187	260,023	260,210
1969	7,165	198,628	205,793
1970	1,664	245,550	247,214
1971	68,914	116,391	185,305
1972	78,619	120,316	198,935
1973	143,746	179,259	328,005
1974	171,887	277,170	449,057
1975	181,840	176,389	360,560
1976	177,864	223,792	401,656
1977	248,721	210,194	458,915
Previous 5 yr. average	151,791 (184,812)	195,385 (213,361)	347,176 398,173

1/ Subdistricts 335-10 and 335-20.

2/ Catches are expanded and include all villages surveyed each year, 335-10, 335-20 and 335-30 to the Swift River.

3/ Includes minimal numbers of red, pink and coho salmon.

Appendix Table 11. Comparative commercial chum salmon catch data by fishing period during the chum salmon season Kuskokwim River (subdistrict 1, statistical area 335-11), 1971-1976

Fishing periods	1971 Catch	1971 Boats	1971 C.F.H. 1/	1972 Catch	1972 Boats	1972 C.F.H.	1973 Catch	1973 Boats	1973 C.F.H.	1974 Catch	1974 Boats	1974 C.F.H.	1975 Catch	1975 Boats	1975 C.F.H.	1976 Catch	1976 Boats	1976 C.F.H.	1977 Catch	1977 Boats	1977 C.F.H.
June 25-27							19,073	202	7.9	27,017	267	16.9									
June 28-30	11,386	150	6.3	9,863	87	9.4	47,258	250	7.9				31,114	253	20.5	42,464	348	20.3	40,321	378	17.8
July 1-3	8,949	111		19,084	115	13.8	21,410	242	7.4	55,356	380	12.1	34,417	374	15.3	44,024	415	17.7	58,884	409	24.0
July 4-6	17,672	104		19,039	101	16.8	31,056	212	12.2	27,211	282	8.0							37,500	331	19.0
July 7-9	12,603	93					24,593	217	9.4	50,672	376	11.2	38,752	368	17.6	48,669	381	21.3	56,943	368	25.8
July 10-12	2,550	18		13,972	113	10.3							39,791	301	22.0	21,153	377	9.4			
July 13-15	8,000	69		6,290	80	6.5							20,945	329	10.6	14,176	265	8.9	24,765	385	10.7
July 16-18										6,661	190	5.8									
July 19-21	5,989	71																			
Total	67,149	216	9.1	69,048	176	11.6	143,390	341	8.7	166,917	467	11.0	165,049	540	16.9	170,486	517	15.9	218,413	522	14.0
Associated Data Fishermen hrs. 2/		7,392			5,952			16,476			15,198			9,750			10,716			15,660	
Days open to fishing 3/		3.5			2.5			3.0			2.0			1.25			1.25			1.25	

1/ Catch per fisherman hour.

2/ Number of fishermen multiplied by hours open to fishing.

3/ One day is equivalent to 24-hours of fishing time.

ERROR

Apı Table 12. Comparative commercial coho salmon catch data by wc wer Kuskokwim River (subdistrict 1, stat. area 335-10) 1970-1'

Date	1970 Catch	1970 Fisher-men	1970 Fisher-man hrs.	1970 C.F.H.[1]	1971 Catch	1971 Fisher-men	1971 Fisher-man hrs.	1971 C.F.H.	1972 Catch	1972 Fisher-men	1972 Fisher-man hrs.	1972 C.F.H.	1973 Catch	1973 Fisher-men	1973 Fisher-man hrs.	1973 C.F.H.
Aug. 1-8	8,308	137	5,934	1.4	699	27	648	1.1	1,480	82	1,968	0.8	12,605	198	2,376	5.3
Aug. 9-15	14,834	222	12,870	1.2	1,670	46	4,416	0.4	9,706	183	17,568	0.6	62,928	351	33,696	1.9
Aug. 12-21	10,879	209	10,416	1.0	764	25	2,400	0.3	9,733	180	17,280	0.6	39,886	308	22,176	1.8
Aug. 19-29	2,930	115	4,494	0.7	2,048	29	2,784	0.7	1,423	61	5,856	0.2	14,371	248	17,856	0.8
Aug. 26-Sep. 3	349	22	768	0.5	72	5	480	0.2	237	28	2,688	0.1	867	16	1,152	0.8
Sep. 3-9													136	4	222	0.6
Totals	37,300	266	34,482	1.1	5,253	83	10,728	0.5	22,579	245	45,360	0.5	130,793	411	77,478	1.7

Date	1974 Catch	1974 Fisher-men	1974 Fisher-man hrs.	1974 C.F.H.	1975 Catch	1975 Fisher-men	1975 Fisher-man hrs.	1975 C.F.H.	1976 Catch	1976 Fisher-men	1976 Fisher-man hrs.	1976 C.F.H.	1977 Catch	1977 Fisher-men	1977 Fisher-man hrs.	1977 C.F.H.
Aug. 1-8	9,576	267	3,444	2.8	2,346	148	888	2.6	10,534	286	6,864	1.5	23,987	360	8,640	2.8
Aug. 9-15	59,090	444	31,968	1.9	12,171[2]	293	14,064	0.9	29,728	400	19,200	1.5	91,474[3]	487	23,376	3.9
Aug. 12-21	58,066	396	28,512	2.0	18,020	362	17,376	1.0	28,664	387	18,576	1.5	60,935	438	10,512	5.8
Aug. 19-29	12,301	263	18,936	0.6	33,128	387	18,576	1.8	14,543	300	14,400	1.0	25,589[4]	378	4,536	5.6
Aug. 26-Sep. 3	5,360	107	7,704	0.7	16,280	274	13,152	1.2	4,420	174	7,308	0.6	16,980[5]	361	4,332	3.9
Sep. 3-9	430	25	1,815	0.2									11,874[6]	264	3,168	3.8
													6,819[7]	204	2,448	2.8
Totals	144,823	516	92,379	1.2	81,945	533	64,056	1.3	87,889	516	66,348	1.3	237,658	572	57,012	4.2

3/ Aug. 8-10 4/ Aug. 18 5/ Aug. 22 6/ Aug. 25 7/ Aug. 29

Appendix Table 13. Comparative Kuskokwim River king salmon subsistence catches by village, 1960-1978

Village	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1960-1973 Average	1974-1978 Average
Kwigillingok, Kipnuk, Kongiganak	250	283	54	229	414	0 1/	205	957	70	385	1,111	241	10	75	10/	10/	197	743	75	338	338
Eek	1,474 3/	2,238 3/	1,060 3/	2,697 3/	1,857	2,737	2,872	4,375	2,760	2,037	2,065	1,882	1,969	1,981	2,356	2,110	3,232	2,675	1,807	1,960-1973 Average	2,436
Tuntutuliak	226	2,226	842	2,353	1,826	1,978	3,061	3,338	2,026	2,195	3,558	1,841	3,214	2,859	1,577	3,492	4,807	2,470	1,656		2,800
Kasigluk	135	1,215	127	1,302	4/	513	1,875	2,766	1,360	2,888	3,931	1,645	1,292	8,864	1,411	1,713	1,613	1,324	608		1,334
Nunapitchuk	683	2,042	848	1,874	636	490	2,875	1,926	1,360	2,279	4,680	1,970	2,496	2,663	1,165	2,092	2,578	2,622	2,178		2,127
Atmauthluak 6/											1,205	548	864	1,106	382	1,042	1,159	1,015	966	330	913
Napakiak	1,830	2,573	2,191	3,148	2,677	1,670	3,592	3,922	2,317	3,546	4,960	1,868	2,009	1,763	1,224	2,864	3,330	2,702	2,140	2,286	2,452
Oscarville	1,968	282	75	309	339	678	301	1,327	393	457	542	570	196	586	180	891	623	672	349	2,289	543
Napaskiak	536	1,258	759	1,569	2,201	1,412	2,935	3,091	1,647	2,227	3,446	1,916	1,578	2,048	900	2,303	3,566	1,989	2,122	1,609	2,176
Bethel	1,923	4,150	1,378	7,019	4,114	3,342	7,604	11,772	4,900	7,472	17,026	8,731	8,371	8,898	4,631	11,688	13,215	9,408	6,905	1,916	9,169
Kwethluk	2,692	3,763	2,329	5,050	3,262	4,538	6,135	6,889	3,549	3,187	7,932	5,564	5,137	3,444	2,694	3,179	4,193	5,563	3,172	931	3,760
Akiakchak	1,626	3,052	1,800	2,533	3,488	3,952	4,957	5,543	3,415	2,602	7,022	4,818	3,872	2,592	1,726	3,534	4,915	5,407	2,951	2,719	3,707
Akiak	1,865	3,159	906	2,869	2,495	1,774	3,941	3,790	1,332	1,275	3,290	2,688	1,899	1,895	1,292	2,837	3,076	2,880	1,850	573	2,387
Tuluksak	737	1,486	493	1,295	572	1,019	1,559	1,710	1,048	1,131	1,995	1,280	1,318	1,322	883	1,338	1,411			1,902	
Lower Kalskag	961	571	805	2,661	710	841	1,918	1,733	1,463	2,083	2,146	2,355	2,604	1,309	1,586	2,755	4,536			6,907	
Upper Kalskag	667	1,049	7/	7/	1,143	719	1,333	1,699	1,404	1,623	734	601	401	938	463	1,752	1,431			4,534	
Aniak	1,057	688	185	602	1,104	494	2,002	1,415	467	1,406	2,136	1,076	2,105	1,030	1,952	1,391	1,490	2,906	1,906	3,662	1,689
Chuathbaluk	64	54	10	30	74	29	139	217	40	180	219	179	261	942	674	594	657	1,750	1,951	2,365	2,516
Napamute	20	16	44	52	134	2	78	60	100	19	22	17	20	13	6	16	420	2,813	1,253	1,212	1,542
Crooked Creek	747	518	561	859	1,358	363	1,249	638	77	541	684	291	183	269	650	238	264	4,991	1,331	1,583	2,231
Georgetown	10/	10/	10/	10/	10/	10/	12	10/	10/	9	2	0	0	0	9/	10/	10/	1,507	1,238	1,026	934
Red Devil	10/	40	144	228	314	10/	182	10/	111	142	232	135	182	138	205	623	195			1,126	
Sleetmute	465	222	9/	9/	9/	491	149	343	200	267	161	181	69	504	269	256	356			174	
Stony River	435	25	31	67	299	101	632	364	191	2,187	105	2,521 11/	95	287	439	861	653 11/			43	
Totals	20,361	30,910	14,642	37,246	29,017	27,143	49,606	57,875	30,230	40,138	69,204	42,926	40,145	38,525	26,665	47,569	57,917			596	
																		176	144	4	152
																		619	488	168	341
																		66	101	277	66
																		324	153	524	300
																		684	456	38,757	404
																		33	182		434
																		55,339	35,881		44,751

1/ Included with other villages.
2/ Does not include 1965.
3/ Estimates based on catch data through 1969.
4/ Included with Eek.
5/ Does not include 1964.
6/ New village of Atmauthluak segregated in 1970 from parent village of Nunapitchuk.
7/ Included with Lower Kalskag.
8/ Does not include 1962 and 1963.
9/ Included with Red Devil.
10/ Data not available.
11/ Includes Lime Village.

Appendix Table 13. Comparative Kuskokwim River king salmon subsistence catches by village, 1960-1976 1978

Village	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Kwigillingok, Kipnuk, Kongiganak	250	283	54	229	414	0 1/	205	957	70	385	1,111
Eek	1,474 3/	2,238 3/	1,060 3/	2,697 3/	1,857	2,737	2,872	4,375	2,760	2,037	2,065
Tuntutuliak	226	2,226	842	2,353	1,826	1,978	3,061	3,338	2,026	2,195	3,558
Kasigluk	135	1,215	127	1,302	4/	513	1,875	2,766	1,360	2,888	3,931
Nunapitchuk	683	2,042	848	1,874	636	490	2,875	1,926	1,360	2,279	4,680
Atmauthluak 6/											1,205
Napakiak	1,830	2,573	2,191	3,148	2,677	1,670	3,592	3,922	2,317	3,546	4,960
Oscarville	1,968	282	75	309	339	678	301	1,327	393	457	542
Napaskiak	536	1,258	759	1,569	2,201	1,412	2,935	3,091	1,647	2,227	3,446
Bethel	1,923	4,150	1,378	7,019	4,114	3,342	7,604	11,772	4,900	7,472	17,026
Kwethluk	2,692	3,763	2,329	5,050	3,262	4,538	6,135	6,889	3,549	3,187	7,932
Akiakchak	1,626	3,052	1,800	2,533	3,488	3,952	4,957	5,543	3,415	2,602	7,022
Akiak	1,865	3,159	906	2,869	2,495	1,774	3,941	3,790	1,332	1,275	3,290
Tuluksak	737	1,486	493	1,295	572	1,019	1,559	1,710	1,048	1,131	1,995
Lower Kalskag	961	571	805	2,661	710	841	1,918	1,733	1,463	2,083	2,146
Upper Kalskag	667	1,049	7/	7/	1,143	719	1,333	1,699	1,404	1,623	734
Aniak	1,057	688	185	602	1,104	494	2,002	1,415	467	1,406	2,136
Chuathbaluk	64	54	10	30	74	29	139	217	40	180	219
Napamute	20	16	44	52	134	2	78	60	100	19	22
Crooked Creek	747	518	561	859	1,358	363	1,249	638	77	541	684
Georgetown	10/	10/	10/	10/	10/	10/	12	10/	10/	9	2
Red Devil	10/	40	144	228	314	10/	182	10/	111	142	232
Sleetmute	465	222	9/	9/	9/	491	149	343	200	267	161
Stony River	435	25	31	67	299	101	632	364	191	2,187	105
Totals	20,361	30,910	14,642	37,246	29,017	27,143	49,606	57,875	30,230	40,138	69,204

Village	1971	1972	1973	1974	1975	1976	1977	1978
Kwigillingok, Kipnuk Kongiganak	241	10	75	10/	10/	197	743	75
Eek	1,882	1,969	1,981	2,356	2,110	3,232	2,675	1,807
Tuntutuliak	1,841	3,214	2,859	1,577	3,492	4,807	2,470	1,656
Kasigluk	1,645	1,292	8,864	1,411	1,713	1,613	1,324	608
Nunapitchuk	1,970	2,496	2,663	1,165	2,092	2,578	2,622	2,178
Atmauthluak 6/	548	864	1,106	382	1,042	1,159	1,015	966
Napakiak	1,868	2,009	1,763	1,224	2,864	3,330	2,702	2,140
Oscarville	570	196	586	180	891	623	672	349
Napaskiak	1,916	1,578	2,048	900	2,303	3,566	1,989	2,122
Bethel	8,731	8,371	8,898	4,631	11,688	13,215	9,408	6,905
Kwethluk	5,564	5,137	3,444	2,694	3,179	4,193	5,563	3,172
Akiakchak	4,818	3,872	2,592	1,726	3,534	4,915	5,407	2,951
Akiak	2,688	1,899	1,895	1,292	2,837	3,076	2,880	1,850
Tuluksak	1,280	1,318	1,322	883	1,338	1,411	2,906	1,906
Lower Kalskag	2,355	2,604	1,309	1,586	2,755	4,536	1,750	1,951
Upper Kalskag	601	401	938	463	1,752	1,431	2,813	1,253
Aniak	1,076	2,105	1,030	1,952	1,391	1,490	4,991	1,331
Chuathbaluk	179	261	942	674	594	657	1,507	1,238
Napamute	17	20	13	6	16	420	176	144
Crooked Creek	291	183	269	650	238	264	619	488
Georgetown	0	0	0	9/	10/	10/	66	10/
Red Devil	135	182	138	205	623	195	324	153
Sleetmute	181	69	504	269	256	356	684	456
Stony River	2,521 11/	95	287	439	861	653 11/	33	182
Totals	42,926	40,145	38,525	26,665	47,869	57,917	55,339	35,881

1960-1973 Average	1974-1978 Average
338	
2,436	
2,800	
1,334	
2,127	
913	
2,452	
543	
2,176	
9,169	
3,760	
3,707	
2,387	
3,662	
2,366	1,689
1,212	2,516
1,583	1,542
1,026	2,231
1,126	934
174	
43	
596	
4	152
168	341
277	66
624	300
38,757	404
	434
	44,751

1/ Included with other villages.
2/ Does not include 1965.
3/ Estimates based on catch data through 1969.
4/ Included with Eek.
5/ Does not include 1964.
6/ New village of Atmauthluak segregated in 1970 from parent village of Nunapitchuk.
7/ Included with Lower Kalskag.
8/ Does not include 1962 and 1963.
9/ Included with Red Devil.
10/ Data not available.
11/ Includes Lime Village.

Table 5. Summary of special projects conducted in the Kuskokwim district, 1977.

1. Kuskokwim River Test Fishing.

   a. Location: Kwegooyuk on the east bank of the mouth of the Kuskokwim River located 56 river miles downstream from Bethel.
   b Objectives: Determine run timing and relative abundance of kings, red and chum salmon.
   c. Results: The 1977 project captured 1,264 kings, 576 chums and 169 sockeye, totaling 2,009 salmon between June 5 and July 14. The king salmon catch was one of the largest ever and accurately reflected a good king salmon run in the Kuskokwim River. However, the chum salmon catch was one of the lowest ever; and for one of the few times since the program began, was not indicative of what later proved to be an exceptional chum salmon run.

2. Kogrukluk River Counting Tower.

   a. Location: About three miles on the Kogrukluk River, tributary to the Holitna River.
   b. Objectives: Determine daily and seasonal timing and magnitude of all species of salmon entering this stream. Conduct visual size of relative age of the king salmon escapement.
   c. Results: The estimated expanded count of salmon escapement from July 7 to July 27 was 1,988 kings, 2,140 reds, 10 pinks, and 5,047 chums. These counts are minimum escapement counts due to excessive turbidity as a result of record high water on the Kogrukluk River in 1977.

3. Ignatti Weir

   a. Location: Upper Holitna River, about 1.5 miles below the Kogrukluk River.
   b. Objectives: Develop a partable weir and trap to enumerate salmon escapement by species and sex and to obtain salmon for samplong without causing harm to the fish.
   c. Results: The Holitna River weir enumerated 1,385 kings, 1,112 reds, and 10,388 chums during the period from July 14-27, 1977. In 1976 the weir crew counted 5,507 kings, 2,302 reds, and 8,046 chums during the period from June 29 to July 31, 1976. The brief period of oepration in 1977 was due to extreme high water levels which never receded to the highest recorded levels of water depth experioenced during weir operation last year. Water depths at the deepest part of the weir ranged from a low of 5 feet to over 7 feet.

4. Lower Kuskokwim River Management Investigations

   a. Location: Between Akiak and Fowler Island.
   b. Objectives: Monitor subsistence catch inorder to obtain data for use in in-season fishery management. Determine age, mesh size, and depths of salmon nets currently being used in study area.
   c. Results: Daily subsistence catches were obtained as well as a representative sample of salmon net types used in the area. The crew also provided needed public relations function.

Table 5. (continued)

5. Commercial Salmon Catch Sampling

   a. Location: Bethel
   b. Objectives: Obtain age, sex and size information for commercially caught fish.
   c. Results: Samples of all species were sampled, analyzed and presented in separate reports.

Appendix Table 14. Comparative Kuskokwim River "other salmon" subsistence catches by village, 1960-1978. 1/2/

Village	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Kipnuk, Kongiganak, Kwigillingok	1,410 4/	3,279 4/	1,990 4/	2,562 4/	2,323	0	680	2,846	2,800	2,481	3,937	1,110	1,284	807
Eek	4,094 4/	2,321	2,072 4/	1,771 4/	3,151	2,898	1,324	1,922	3,503	3,436	4,855	2,213	783	2,401
Tuntutuliak	4,101	8,526	9,692	6,791	8,421	18,993	9,747	11,531	14,090	17,462	10,600	9,964	11,103	13,572
Kasigluk	1,400	3,657	1,705	1,020	5/	4,041	3,058	2,309	4,311	3,308	5,731	2,043	1,934	6,090
Nunapitchuk	2,743	4,868	7,474	2,462	1,171	4,251	4,145	6,278	7,731	6,934	11,412	3,375	5,600	7,663
Atmauthluak											1,191	1,197	947	2,818
Napaskiak	19,898	5,789	6,167	3,711	12,312	12,928	9,275	12,685	12,700	12,390	16,371	4,427	5,191	8,461
Oscarville	3,948	1,680	1,723	1,025	487	8,010	407	2,580	2,104	2,743	4,669	1,675	498	3,081
Napaskiak	5,199	4,286	5,546	3,584	6,275	26,206	8,743	8,585	12,409	11,655	11,169	7,039	8,858	8,478
Bethel	12,972	12,845	8,470	8,623	15,623	19,099	14,011	14,055	28,603	14,613	33,475	9,905	16,885	33,930
Kwethluk	32,975	21,106	22,788	13,188	19,186	37,780	18,707	23,872	36,645	23,462	27,702	13,941	11,721	19,565
Akiakchak	15,932	12,518	10,521	6,725	10,096	25,138	15,049	13,584	19,461	10,306	29,776	12,298	9,266	9,864
Akiak	13,061	8,205	6,551	8,478	9,659	12,297	10,622	9,332	13,775	9,854	13,003	9,264	5,108	6,118
Tuluksak	19,261	7,928	8,526	10,209	9,777	12,020	11,670	8,898	11,114	6,058	7,626	5,115	5,145	5,946
Lower Kalskag	11,563	7,764	16,478	23,249	9,472	21,906	10,346	16,018	8,114	8,468	11,158	3,509	3,490	2,873
Upper Kalskag	38,398	27,149	7/	7/	11,391	11,970	6,236	8,364	9,733	9,413	5,309	3,530	1,460	5,607
Aniak	36,673	15,935	10,120	10,808	17,874	11,353	12,484	16,788	17,341	15,127	10,030	4,933	5,243	13,547
Chuathbaluk	22,370	2,922	3,784	2,629	5,059	6,507	5,625	7,249	11,588	7,523	10,971	5,632	8,509	14,171
Napamute	11,017	6,235	3,098	5,192	4,073	704	3,704	5,750	1,774	1,453	1,224	1,862	4,645	3,451
Crooked Creek	41,263	17,558	27,259	23,166	32,550	10,986	19,467	14,365	12,704	6,810	9,216	3,094	3,658	1,981
Georgetown	9/	9/	9/	9/	9/	9/	70	9/	2,030	3,664	800	0	0	10
Red Devil	9/	1,350	9,007	5,367	5,706	9/	2,746	9/	2,400	1,130	2,454	1,067	1,695	2,782
Sleetmute	17,259	6,884	10/	10/	10/	11,707	2,611	6,875	11,218	8,258	4,464	3,203 11/	4,293	2,168
Stony River	11,750	2,642	1,055	1,110	4,254	15,865	3,933	11,377	13,875	12,080	8,407	5,995	3,000	3,875
Totals	327,297	185,447	165,626	141,550	189,660	283,459	174,660	205,263	260,023	198,628	245,550	116,391	120,316	79,259

Village	1974	1975	1976	1977	1978	1960-1973 Average	1974-1978 Average
Kipnuk, Kongiganak, Kwigillingok	9/	9/	902	2,190		1,966	
Eek	4,227	2,754	4,425	3,251	78	2,625	1,056
Tuntutuliak	28,321	7,429	8,440	9,340	1,874	11,042	3,306
Kasigluk	6,773	3,708	4,050	3,504	5,564	3,124	11,819
Nunapitchuk	12,498	5,447	6,551	8,991	1,242	5,436	3,855
Atmauthluak	4,585	2,524	3,446	3,693	4,977	1,538	7,963
Napaskiak	21,494	11,630	9,477	8,420	3,860	10,164	3,622
Oscarville	5,617	3,237	2,416	2,030	6,074	2,474	11,419
Napaskiak	20,467	12,930	21,518	11,588	1,276	9,145	2,915
Bethel	34,892	26,808	26,970	15,982	9,286	17,365	15,158
Kwethluk	39,747	19,183	27,120	28,193	13,731	23,046	23,677
Akiakchak	15,108	14,008	16,050	18,607	14,038	14,324	25,655
Akiak	18,434	18,890	12,337	13,952	9,445	9,666	14,644
Tuluksak	13,261	7,819	11,833		9,237	9,298	14,570
Lower Kalskag	12,265	9,823	17,169	7,835		11,029	
Upper Kalskag	9,631	6,904	8,694	8,964	4,478	11,547	9,045
Aniak	9,305	9,597	13,507	11,845	3,704	14,147	10,385
Chuathbaluk	4,207	561	7,967	21,610	7,279	8,181	8,871
Napamute	76	226	1,653	5,141	8,042	3,984	12,412
Crooked Creek	4,954	2,461	3,236		4,885	16,577	4,568
Georgetown	9/	9/	9/	4,969		939	
Red Devil	2,688	4,481	4,231	3,072	1,887	3,246	1,762
Sleetmute	4,212	5,761	7,620	1,127	2,469	7,176	3,238
Stony River	4,328	5,202	8,484 11/	5,916	9/	7,144	1,127
Totals	277,170	176,309	228,104	6,674	6,161	205,103	4,695
				3,300	7,917		6,439
					3,545		4,972
				210,194	131,049		207,173

Catches include a majority of chum salmon but include small numbers of red, coho, pink and small king salmon.
1965 to 1972 catches do not include late coho salmon catches.
Does not include 1965.
4/ Estimate based on catch data through 1970.
5/ Included with Eek.
6/ Does not include 1964.
7/ Included with Lower Kalskag.
8/ Does not include 1962 and 1963.
9/ Data not available.
10/ Included with Red Devil.
11/ Includes Lime Village.

Appendix Table 18. Comparative Kuskokwim River drainage king salmon escapement counts.[1/2/]

Kwethluk River				Kisaralik River			
Year	Estimated Count	Area Surveyed[3/]	Survey Rating	Year	Estimated Count	Area Surveyed	Survey Rating
1960	1,320	Upper 40 miles	?	1960	1,104	Entire	Fair
1962	248	Entire	Poor	1962	327	Entire	Poor
1966	516	Upper 35 miles	Fair	1965	194	Below canyon	Poor
1968	800	Entire	Fair	1966	204	Upper 60 miles	Poor
1972	68	Upper 20 miles	Poor	1968	487	Upper river	Fair
1974	88	Upper 30 miles	Poor	1970	531	Airstrip to Quicksilver Cr.	Fair
1975	Few	Lower 40 miles	Poor	1973	152	Airstrip to 1 mi. above falls	Fair,
1976	997	40 mi. d.s. from mouth of Canyon Cr.	fair	1974	4	Airstrip to 30 mi. upstream	Poor
				1975	129	Entire	Poor/Fair
1977	1,999	3-step Mt. to Canyon Creek	fair	1976	873	10 mi. below foothills to lake	Fair

Aniak River[4/]				Aniak River (above Salmon River)			
Year	Estimated Count	Area Surveyed	Survey Rating	Year	Estimated Count	Area Surveyed	Survey Rating
1960	1,881	Entire	Fair	1966	485	Salmon R. to lake	Fair
1961	497	Entire	Fair	1967	758	Salmon R. to lake	Poor
1962	925	Entire	Fair	1968	783	Salmon R. to lake	Good
1965	646	Mile 20 to lake	Poor	1969	537	Salmon R. to lake	--
1966	2,184	Buckstock R. to lake	Fair	1970	592	Salmon R. to Waterboot Cr.	Fair
1968	1,420	Buckstock to Kipchuk River	Fair	1971	144	Waterboot Creek to Aniak Lake	Poor
1970	1,231	20 mi. below Salmon R. to Waterboot Creek	Fair	1972	93	Salmon R. to lake	Poor
				1973	200	Salmon R. to lake	Poor
1974	196	Entire	Poor	1974	57	Salmon to lake	Poor
1975	202	Entire	Fair	1975	145	Salmon to lake	Fair
1976	281	Kipchuk River to Gemuk Mt.		1976		No Information Available	
				1977	21	5 mi. below lake to canyon below Gemuk Mt.	Fair

Salmon River				Kipchuk River			
ar	Estimated Count	Area Surveyed	Survey Rating	Year	Estimated Count	Area Surveyed	Survey Rating
1960	223	Entire	Good	1960	513	Entire	Good
1966	141	Lower 25 miles	Poor	1966	491	Lower 22 miles	Good
1970	381	Lower 25 miles	Fair	1967	200	Lower 25 miles	Poor
1972	43	Entire	Poor	1968	319	?	Fair
1973	100	Mouth to Cripple Cr.	Poor	1970	821	Mouth-Cripple Creek	Fair
1974	35	Entire	Good	1974	73	Entire	Good
1975	32	Entire	Fair	1975	94	Entire	Fair
1976	86	mouth to Marvel Creek	Poor	1976	177	Mouth to Big Bend	Fair
1977	625	mouth to Marvel Creek	Fair	1977	16	5 mi. from canyon downstream	Poor

Chukowan River				Kogrukluk River			
Year	Estimated Count	Area Surveyed	Survey Rating	Year	Tower Count	Aerial Survey Count	Area Surveyed	Survey Rating
1966	986	Mouth-Gemuk River	Good	1961		214	Entire	Fair
1968	1,260	Mouth-Gemuk River	Fair	1966		1,645	Entire	Good
1970	1,118	Mouth-Gemuk River	Good	1967		1,033	Entire	Poor
1972	163	Mouth-Gemuk River	Poor	1968		2,180	Entire	Fair
1973	229	Mouth-Gemuk River	Fair	1969	2,980	-	-	-
				1970	3,868[5/]	1,598	Entire	Fair
1975	667	Mouth-Gemuk River	Fair	1971	42[5/]	636	Headwater to 15 mi above mouth	Poor
			Fair					
				1972	1,934	476	Entire	Fair
				1973	1,725	610	Entire	Poor
				1974	3,724			
				1975	1,970	1,062	Entire	Fair
1976	727	Entire	Fair	1976	3,261 5,507[5/] 1,988	(1976) 518	tower to Maka Creek	fair
				1977	1,385[5/]	1,342	Entire	

1/ All counts are from aerial surveys, except tower counts which are in parenthesis.
Aerial survey counts were made only in main stem of each river listed.
"Entire" usually does not include several miles of the lower sections of streams where turbid water conditions prevent observation of fish.
4/ Includes Aniak River above Salmon River.
5/ Weir count.